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NORTHWESTERN UNIVERSITY

SCHOOL OF PHARMACY

CHICAGO, - ILLINOIS

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CIRCULAR OF INFORMATION

FOR 1896–97

Northwestern University Press

NORTHWESTERN UNIVERSITY.

ANNOUNCEMENT.

Northwestern University comprises the following degree-conferring departments, each having a distinct Faculty of Instruction:

The College of Liberal Arts,
The Medical School,
The Law School,
The School of Pharmacy,
The Dental School,
The Woman's Medical School,
The Schools of Theology.

The departments of the University are established in Chicago and Evanston, Illinois. The professional schools of Medicine, Law, Pharmacy and Dentistry were established in the former place because of the advantages which a great city affords to those engaged in professional study. The College of Liberal Arts was established in Evanston because of the advantages to be derived from carrying on undergraduate study in a place somewhat removed from the distractions of a large city. The total number of students enrolled in the various departments of the University during the year 1895–96, excluding names counted twice, was over 3,000.

SPECIAL NOTICE.

Both Junior and Senior Students will be admitted to the School of Pharmacy of Northwestern University on September 1st, 1896, and both classes will be concurrently but separately taught as heretofore from that date until February 1st, 1897.

A Senior Course *only* will be given during the spring semester from February 1st to June 17th, 1897.

No Junior Students will after 1896 be admitted at any other time than the beginning of the fall semester, the first week-day of September. Junior courses will not hereafter be given in the spring. But Senior Courses will be given during the spring semesters as heretofore.

The School Calendar for the year will be found on the third page of the cover of this circular.

OFFICERS OF THE BOARD OF TRUSTEES OF THE UNIVERSITY.

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EXECUTIVE COMMITTEE OF THE SCHOOL OF PHARMACY.

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The members of this Executive Committee are Experienced Practical Pharmacists, and only Practical Pharmacists of Illinois are eligible as their successors.

FACULTY.

HENRY WADE ROGERS, LL.D.,
President of the University.

OSCAR OLDBERG, PHARM. D., DEAN,
Professor of Pharmacy.
7808 Union Avenue, Auburn Park.

JOHN HARPER LONG, SC.D.,
Professor of Chemistry.
7748 Sangamon Street, Auburn Park.

WILLIAM EDWARD QUINE, M.D.,
Emeritus Professor of Physiology, Therapeutics and Toxicology.

HENRY KRÆMER, PHIL. B., PH.G.,
Professor of Botany, Materia Medica and Pharmacognosy.

JAN BAREND NAGELVOORT,
Professor of Applied Pharmaceutical Chemistry.
2421 Dearborn Street.

JOHN DAVIS KALES, M.D.,
Professor of Bacteriology.
3400 Indiana Avenue.

WILLIAM KERR HIGLEY, PH.C.,
Assistant Professor of Botany and Pharmacognosy.
6133 Monroe Avenue.

MAURICE ASHBEL MINER, PH.C.,
Assistant Professor of Pharmacy; Pharmaceutical Laboratory.
6446 Lexington Avenue.

FRANK BURNETT DAINS, SC.M.,
Assistant Professor of Chemistry; General Chemical Laboratory.
2601 Calumet Avenue.

CHARLES WAGGENER PATTERSON, Ph.C.,
Instructor in Dispensing.
194 Thirty-seventh Street.

OTTO HUGO PAGELSEN, Sc.B.,
Instructor in the General Chemical Laboratory,
2421 Dearborn Street.

ISAAC DONALDSON RAWLINGS, M.S., M.D.,
Demonstrator of Bacteriology.
2421 Dearborn Street.

VIOLA A. GRISWOLD, Ph. C.,
Amanuensis in the Pharmaceutical Laboratory.

JESSIE GILMAN HALL, *Clerk.*
141 N. Robey Street.

THE SCHOOL OF PHARMACY.

The object of the School of Pharmacy is to place within the reach of any student of good common school education and moderate means a course of pharmaceutical education as thorough as can be given in two semesters of twenty weeks each with the student's whole time occupied, and also to provide an additional and more advanced course for the special training of pharmacists and pharmaceutical chemists.

The importance and advantages of a well-grounded education in pharmacy are great. Systematic special training, such as cannot be attained without the aid of a well-equipped school, is becoming more and more a necessary condition of success in professional pursuits, and the public justly demands proper evidence of fitness on the part of those engaged in the responsible duties of pharmacy.

The pharmacist must be fitted to decide correctly as to the identity, quality and purity of medicines, to combine and dispense them accurately, and to apply for these purposes the best means which scientific training affords. He should be practiced in analytical methods, quantitative as well as qualitative, and in the use of the microscope, and grounded in the scientific principles as well as in the practical operations of pharmaceutical work. He should be equally well prepared for the best professional service at the prescription-table, to aid the physician as the chemist of the medical profession, to act as a public analyst, especially for the protection of health, to undertake the work of the manufacturing laboratory, or for any related technical pursuit.

THE DEMAND FOR TRAINED PHARMACEUTICAL CHEMISTS.

The courses of instruction offered by this School are adapted to fit its students for the varied pursuits which are now open to specially trained workers in all branches of pharmacy, in chemistry and chemical technology, and in the application of microscopy for the detection of adulterations and for other practical purposes.

The demand for technical services in these branches is increasing, the properly educated pharmacist or chemist readily receives just compensation for his professional skill and services, and the only direction in which measurable relief may be found from the unfavorable effects of the excessive commercial competition in the retail drug business of the day points to increased knowledge, greater skill and better service.

The thorough training necessary to the successful pursuit of modern scientific pharmacy is essentially the same as that which constitutes a fit preparation for many of the branches of applied chemistry and technology. Among the industries which are becoming more and more dependent upon trained specialists are those of the manufacture of pharmaceutical preparations, chemicals, food materials, digestive ferments, soaps, perfumery, paints, colors and dyestuffs, starch, sugar and syrups, baking powders, and numerous other products.

The pharmaceutical chemist is well prepared to undertake any of the duties referred to, and to enter upon special work in many branches of the industrial arts.

THE PLAN OF THIS SCHOOL.

Students of pharmacy should, if possible, withdraw completely from employment in drug-stores during the time occupied by their courses of study, not only because any student can accomplish twice as much if he devotes his whole time to his studies as he can if he gives only half of it, but also because partial, interrupted or irregular attention to study is not consistent with the attainment of the best educational results.

When a course of pharmaceutical education is conducted on the assumption that the students continue their occupation in stores, the obligatory attendance or hours of instruction must of course be limited to the amount of school work which it is thought might be accomplished without interfering with the student's ability to earn his living at the same time. But when the whole time of the student is occupied upon his studies to the best advantage, the curriculum successfully accomplished under such conditions is one that could by no means be attained with the time of the student divided between the drug-store and the school, unless the period required for its completion be correspondingly extended.

Students can advantageously devote ten months in succession to courses of study occupying their full time in this School, where at least two-thirds of the school hours are devoted to laboratory practice. It is an axiom that any systematic course of education should be, as far as possible, continuous, and the studies must, of course, be mastered, digested and assimilated from day to day and from week to week.

This School is so conducted that the whole time of the student is advantageously devoted to his school work during his attendance, and is in active operation nearly ten months of each year, whereby the courses of instruction are rendered continuous and no time is lost. This plan effects a great saving of time and expense to the student, because it enables him to accomplish far more in the time at his disposal than is possible when his time is divided between the drug-store and the college; the principal items of expense incident to college attendance are the cost of board and the loss of remunerative employment, and the plan upon which this school is conducted allows him to resume his business engagements with increased compensation within the shortest time compatible with the completion of his course.

THE NEW BUILDING.

The new home of this School is an imposing edifice of six stories, and containing liberal provision for lecture rooms, laboratories, library and museum, recitation-rooms, professors' rooms, offices, cloakrooms, and other requisites of a well-appointed modern college building.

The laboratories and other rooms of the School of Pharmacy are supplied with the conveniences afforded by steam, electricity and gas, and are well lighted and ventilated.

The Lecture-Room is ample, airy, exceptionally well furnished, equipped with every convenience for lecture demonstrations, and connected with well supplied preparation and apparatus rooms, and the Chemical Museum.

A large recitation-room is also provided, and an amphitheater seating over four hundred is at the disposal of the School.

Women being admitted to the classes, the School has separate study and dressing-rooms for their exclusive use.

THE LABORATORIES

are among the largest and best equipped of their kind.

THE LABORATORY FOR BOTANY, MICROSCOPY AND PHARMACOGNOSY

is a room about 40x50 feet, lighted on three sides, but chiefly from the north and east, and perfectly adapted to its special uses. This laboratory adjoins the museum.

The work done in it is specially directed to the practical study of plant drugs, their identification and the means by which their quality may be determined by their physical characters, the detection of adulterants in powders, etc.

THE CHEMICAL LABORATORIES.

The three principal *chemical laboratories* are all on one floor, 110x105 feet. Their walls are of a special, hard, impervious, smooth-faced brick, and the furniture and fixtures are of oak. The fourth chemical laboratory is a *Combustion-Room* on the next floor, and is asphalt paved, provided with soapstone tables, etc. All the laboratories are well supplied with effective fume chambers.

The *General Chemical Laboratory* occupies about 50x105 feet, and is lighted on three sides and a part of the fourth side, besides having skylights for both light and ventilation.

The courses here include elementary experimental chemistry, preparatory qualitative work, urine analysis, and volumetric analysis.

The *Laboratory for Applied Pharmaceutical Chemistry* is 50x50 feet and lighted on two sides. Adjoining is the *Balance Room*, and next to it the supply room, situated between the laboratories. Students taking the course for the degree of Pharmaceutical Chemist devote about three-fourths of their time to the courses in this laboratory during the entire second year.

The courses consist of qualitative and quantitative analysis and its practical application to pharmacy, as well as preparation for the duties of public analysts. (See pages 19–21).

The *Laboratory for Physiological Chemistry* is about 50x60 feet, lighted on three sides and also provided with skylights. The courses here are elective; they include the chemistry of digestion, etc., and are open to students who have completed the courses in the General Chemical Laboratory.

THE PHARMACEUTICAL LABORATORIES.

The *General Pharmaceutical Laboratory* occupies a room 50x60 feet, lighted on three sides. It is provided with steam water-baths, drying closet, steam stills and evaporating pans, fume chambers, etc.

The courses in this laboratory include the study of principles and methods employed for the production of chemical and galenical pharmaceutical preparations, the purification of the proximate principles of plant drugs.

The *Dispensing Laboratory* is a room about 40x50 feet, lighted from two sides. It is well supplied with a most complete outfit of the apparatus, implements and devices employed in compounding and dispensing medicines.

About four hundred and fifty students can be simultaneously at work in the laboratories described in the foregoing paragraphs, and three hundred and eighty-four students can receive, in each laboratory, in any one school term, the amount of laboratory instruction and practice specified, while at the same time a large number of additional students are pursuing special courses.

There are also in the same building a *Laboratory of Human Histology* and a *Bacteriological Laboratory*, belonging to the Medical School of the University, open to the students of pharmacy.

THE MUSEUM.

This occupies a corner room about 50x50 feet, and is rapidly assuming considerable proportions. It contains several thousand specimens of official and unofficial drugs, besides fine collections of chemicals.

THE LIBRARY.

The School of Pharmacy receives all of the principal foreign as well as all the American technical periodicals devoted to Pharmacy, Chemistry and Pharmacognosy, and several other scientific publications. The Library further contains all necessary recent works of reference, working manuals, special dictionaries and encyclopædic works, all the pharmacopœias of the world, etc.

THE SCOPE AND METHODS OF INSTRUCTION.

The courses of instruction are graded or progressive, and as comprehensive as is consistent with thoroughness.

The subjects taught are Pharmacy, Physics, Chemistry, Botany, Microscopy, Pharmacognosy, Human Anatomy and Physiology, Materia Medica, Therapeutics and Toxicology, Applied Pharmaceutical Chemistry, Qualitative and Quantitative Analysis, and Bacteriology. The several courses in these departments are outlined on pages 14 to 22.

This School has a separate Faculty for its own special work, and all the teachers devote their entire time and attention to their school work. Thus, the courses of instruction provided for the students are especially adapted to the practical wants of pharmaceutical workers, and the relative amount of time devoted to each subject is in just proportion to its character and importance.

The methods of instruction include lectures, recitations, reviews, class exercises and laboratory practice.

The *lectures* are illustrated by experiments, charts, apparatus, specimens, etc., as occasion requires.

Each student is assured as large a share as practicable of the individual attention of the teachers, and it is sought to make his work interesting as well as instructive, to cultivate his desire for knowledge, and to teach correct methods for its acquisition.

All students are held to their appointed hours of school-work and to the necessary text-book study.

Class Exercises are conducted for the purpose of affording adequate practice in the solution of the pharmaceutical problems, the use of technical nomenclature, the study of prescriptions, and the recognition of drugs and preparations.

Laboratory work, which, in this School, occupies about two-thirds of the instruction hours, is a highly important feature of the courses, and at the same time constitutes the most profitable recreation the student can have.

DEGREES CONFERRED AND GENERAL REQUIREMENTS.

There are two degrees: that of GRADUATE IN PHARMACY (Ph.G.), and that of PHARMACEUTICAL CHEMIST (Ph.C.).

Women are admitted on the same conditions as men.

Satisfactory deportment, the settlement of laboratory accounts, payment in full of all dues, and due observance of the rules of the School, are among the conditions prerequisite to promotion and graduation.

Other requirements are as follows :

REQUIREMENTS FOR THE DEGREE OF GRADUATE IN PHARMACY.

For Admission—Students entering to take the course for the degree of Graduate in Pharmacy must be not less than eighteen years of age, and have a preliminary general education at least equivalent to that required for admission to a public high school.

Students having completed the "Junior Course" in any other college or school of pharmacy are admitted to the Senior Class if deemed prepared to enter upon the studies of the "Senior Course" in this School.

Those intending to take a college course in pharmacy are advised to use a portion of their time in suitable preliminary reading at home or in the store, if practicable. Advice as to what to read will be given, if desired.

For Graduation—The requirements for the degree of Graduate in Pharmacy include regular attendance during two full school terms of the prescribed length—the "Junior Course" and the "Senior Course"—satisfactory completion of the required work, including good standing in the recitations and examinations throughout the courses, and diligence and success in the laboratory work.

The Junior Studies occupy about twenty weeks, and the Senior Studies also occupy a term of the same length.

This course is co-extensive with the established course of pharmaceutical education in England, which occupies ten months and is completed within one year. Simultaneous employment in drug-stores is impracticable unless the student divides the work and devotes two terms instead of one to either the Junior or Senior course, or three or four terms to both together, which may be done without increased cost for tuition.

Students who have made good progress in their Junior Course are strongly advised to enter upon their Senior Course at the next following college term, and not to postpone it any longer than may be unavoidable.

REQUIREMENTS FOR THE DEGREE OF PHARMACEUTICAL CHEMIST.

For Admission—Students having diplomas or certificates of graduation from standard high schools, or from other schools of equal or higher grade, or certificates of good standing in institutions of the collegiate grade, and students presenting evidence of other sufficient educational preparation, satisfactory to the Faculty of the School, are admitted without examination to the course for the degree of Pharmaceutical Chemist.

Persons not presenting conclusive evidence of educational fitness to pursue the course for that degree will be examined in the following branches:

1. *English*—Ability to write English, correct in orthography, punctuation, the use of capitals, grammatical construction, and composition.

2. *Mathematics*—Arithmetic, including common and decimal fractions, percentage and proportion. Algebra, including equations of the first degree containing two or more unknown quantities. In Geometry, the elements of plane geometry.

3. *German or Latin*—The candidate for admission may offer three years in German, or two years in German and one in Latin, or one year in German and two in Latin, as usually included in the courses of study of the public high schools. German is far more important and valuable than Latin.

For Graduation—The degree of Pharmaceutical Chemist is conferred upon students who have completed the prescribed courses and shown good scholarship in the recitations, examinations, and laboratory work. A satisfactory thesis is also required, which must embody the results of research by the student, under the direction of the Faculty. (The subject is to be selected in February.)

Students wishing to take the course for the degree of Pharmaceutical Chemist take their first year's work with the classes taking the course for the degree of Graduate in Pharmacy, and their second year's studies begin on the first week-day of October.

This course is strongly recommended as one that fits the student for the intelligent performance of varied technical services (see pages 5 and 6), as well as for the increased demands of modern scientific pharmacy.

ADMISSION TO ADVANCED STANDING.

Any student presenting proper evidence of having satisfactorily completed in any other good school any one or more of the courses of study included in the curriculum of this School may, if desired, receive such credit therefor as may be consistent with the standard of requirements.

COURSES OF STUDY AND LABORATORY PRACTICE.

JUNIOR WORK.

Occupying About Twenty Weeks.

PHARMACY.

1. *Introductory.*—Definition and scope of Pharmacy. Its objects and problems. Substances used as medicines; their character and composition, and how prepared into efficient and convenient forms.

2. *Metrology and Pharmaceutical Arithmetic.*—Mass, volume and density and their relations to each other. Specific weight and specific volume. Specific Gravity instruments and their use. Weights and Measures. Principles of Metrology. The Metric System. The customary weights and measures of the United States and Great Britain. Balances and graduated measures.

Class drills in the pharmaceutical problems connected with the relations of weight and volume; proportions; "parts by weight;" percentages of strength; diluting, fortifying and mixing, etc.

3. *Pharmaceutical Nomenclature.*—Technical titles and definitions. The latinity of the pharmacopœial titles. Class drills in the correct reading and writing of technical titles.

4. *General Pharmaceutical Operations.*—Heat and its applications and effects in relation to pharmaceutical processes and preparations. Heating apparatus and appliances. Preservation of medicinal substances. Action of heat, light, air and moisture in that respect.

Plant drugs; their collection, cleaning, pruning, drying, garbling.

Comminution, coarse and fine. Powders. Machinery and apparatus for cutting, crushing, pulverization, sifting, etc.

Mixing of solids; mixing of liquids; mixing of solids and liquids. Solution. Simple and chemical solution. Solvents. Physical precipitation. Capillary force, osmosis, dialysis, diffusion. Methods of extraction. Pharmaceutical menstrua. Maceration, digestion, coction; percolation in its various forms. Separation of solids and liquids. Expression, colation, filtration. Clarification. Separation of immiscible liquids. Decolorization. Evaporation and distillation. Crystallization and precipitation.

5. *General Review of the Galenical Pharmaceutical Preparations.*—Classification; inorganic and organic; dry and liquid; officinal and extemporaneous preparations. Mechanical mixtures; solutions. Species, powders, confections, troches, masses, pills. Cataplasms, ointments, cerates, plasters, suppositories. Liquid mixtures; emulsions. Solutions, waters, mucilages, syrups, honeys, glycerites, spirits. Infusions, decoctions, tinctures, fluid extracts, wines, vinegars. Solid extracts, oleoresins, resins. Miscellaneous preparations.

6. *Preparatory Laboratory Course* in the study of the properties of common plant substances, such as starch, gums, sugars, albumin, fixed oils, volatile oils, resins, extractive, etc., and in synthetical inorganic pharmaceutical chemistry and in the production of galenical preparations. This course includes about one hundred and sixty hours of laboratory work.

CHEMISTRY.

7. *General Inorganic Chemistry.*—The lectures in this course cover the field of Inorganic Chemistry with as much General and Theoretical Chemistry as is necessary to give the student a clear insight into the principles underlying Chemistry as a science. In this connection certain important phenomena from the domain of Physics are introduced by way of illustration and explanation. The lectures are followed each week by a recitation or quiz in which the class, divided into sections, is thoroughly drilled in the solution of Chemical problems and other matters presented in the lectures.

8. *Elementary Experimental Chemistry.*—Beginners in the laboratory take up first a course of experiments similar to many shown in the lecture-room, but simpler in detail, and chosen to give the student practical familiarity with elementary facts and principles. The preparation of a large number of simple substances, with a study of their characteristic properties and tests, is included in this course, which serves as a good introduction to Qualitative Analysis.

9. *Qualitative Analysis.*—Two courses are given here; one elementary and the other more advanced. These courses combined give the student sufficient practice for all ordinary needs, and enable him to carry out the identity and purity tests for the inorganic pharmaceutical chemicals, as well as to make full analysis of common substances and complex mixtures.

The more advanced work in qualitative analysis begun in the Junior term is completed in the Senior term.

The chemical laboratory practice referred to in courses 8 and 9 occupies about one hundred and sixty hours in the Junior term.

BOTANY AND MICROSCOPY.

10. *The Organography of Flowering Plants.*—Introductory: The departments of botany; the methods of studying botany. The study of the structure, morphology and functions of roots, stems, leaves, trichomes, flowers, fruits, and seeds. This includes recitations, lectures and laboratory work with the simple microscope. To facilitate the work in organography there will be given in connection with it some instruction in the methods of naming and classifying plants.

11. *Vegetable Histology.*—This course consists of recitations, and lectures and laboratory work with the compound microscope. The subjects included are the cell in general, morphology of the cell wall, cell contents and products, modes of new cell formation, the different tissues and tissue systems, intercellular spaces and their contents. The simple functions of each tissue will be studied.

12. *Vegetable Physiology.*—This course includes lectures and recitations on the following subjects: The properties or attributes of protoplasm, the constituents and food of plants, the absorption of food, the ascent of the sap, the assimilation of food, the distribution and storage of food materials, the distribution and function of gases in the plant, destructive metabolism, influence of temperature and light on the life of the plant, parasites and saprophytes in relation to other plants, movements of plants, irritability of plants, and the phenomena of reproduction in plants.

The instruction in courses 10 to 12 occupies about four hours weekly throughout the Junior term, and consists chiefly of laboratory work.

HUMAN ANATOMY AND PHYSIOLOGY.

13. *Human Anatomy and Physiology.*—This course is designed to give the student such a knowledge of the human body and its functions as will enable him to understand, in a general way, the processes of nutrition, circulation, respiration, etc.

SENIOR WORK.

Occupying About Twenty Weeks.

[This follows the completion of the Junior work, pages 14–16.]

PHARMACY.

14. *The Pharmacy of Inorganic Pharmaceutical Chemistry.*—General principles governing the selection of materials and processes for the preparation of inorganic pharmaceutical chemicals. The pharmacopœial inorganic chemical preparations and their pharmacy. Class problems bearing upon the above mentioned subjects.

15. *Laboratory Practice* in the production of inorganic pharmaceutical chemicals and their purification.

16. *Laboratory Study of Percolation* and other processes of extraction, and of their results. Experimental comparisons and studies.

17. *The Pharmacopœia of the United States.*—The scope and functions of pharmacopœias in general. The essential parts of features of the U. S. P. Its drugs, chemicals and preparations. The pharmacopœial working formulas.

18. *The Art of Dispensing.*—Principles and methods of extemporaneous pharmacy. Classes of preparations. Materials and implements. The special extemporaneous pharmacy of important substances. Prescriptions; correct forms. Class exercises in the reading, interpretation and construction of extemporaneous formulas. Incompatibilities, real and apparent. Doses.

19. *Laboratory Exercises* in the problems of dispensing. Practical drills in the preparation of powders, pills, capsules, troches, tablet triturates, suppositories, ointments, plasters, dressings, mixtures, all kinds of emulsions, etc. Typical and special examples, illustrating the varied phases of dispensing work. Experimental study of incompatibilities and how to overcome difficulties in that direction so far as practicable.

20. *Class Drills in the Identification* of pharmaceutical preparations, by their physical properties, so far as such identification is practicable and useful in the direction of avoiding mistakes.

The practice in the general pharmaceutical laboratory occupies about one hundred and sixty hours, and in the dispensing laboratory about seventy-two hours during the Senior term.

CHEMISTRY.

21. *General Organic Chemistry.*—A course of lectures on Organic Chemistry is given to students who have taken the course on Inorganic Chemistry. These lectures are abundantly illustrated by experiments showing the methods employed in the preparation of many important organic compounds, mainly of pharmaceutical interest. The methods of ultimate organic analysis, the determination of vapor density by the Dumas, Gay-Lussac, V. Meyer and Hofmann processes, and the use and practical applications of the polariscope and other kinds of apparatus for special work, are shown by suitable experiments. In this course special attention is given to the explanation of the important methods and principles of organic synthesis as the groundwork of all accurate knowledge on the subject. The students in this course are quizzed each week on the work covered in the lectures of the preceding week.

22. *Qualitative Analysis.*—The work begun in the first term is

completed, and is followed by practice in the examination of complex mixtures and organic poisons.

23. *Elementary Volumetric Analysis.*—The foundation principles of this branch of quantitative Chemistry are worked out by the student in the laboratory. The preparation and use of standard solutions for alkalimetry and acidimetry, the uses of standard solutions of silver nitrate, potassium permanganate, sodium thiosulphate and other common reagents are determined by experiment.

24. *Urine Analysis.*—This important branch of practical chemistry is taught by laboratory practice after the completion of the preceding courses. The work includes the detection of the important normal and pathological products found in urine, and the volumetric measurement of those which can be accurately determined and which are important for diagnosis.

PHARMACOGNOSY.

25. *Organic Drugs.*—This course includes lectures, recitations and laboratory work, and is divided into three parts:—(1) The histology of roots, stems, leaves, trichomes, and floral organs. (2) The terminology and classification of drugs, the modes of collecting, preparing and preserving drugs, the methods of identifying and estimating the quality of drugs, and the study of all of the more important root, rhizome, corm, bulb, tuber, leaf, leafy-top and flower drugs. (3) Study of all the official and the more important unofficial vegetable drugs not included in part 1, namely, herbs, fruits, seeds, woods, barks and other cellular drugs, and the non-cellular drugs, such as extracts, inspissated juices, sugars, gums, gum-resins, resins, oleoresins and balsams. Laboratory work extends throughout the entire course and consists of the study of good samples of each drug by aid of the simple microscope and suitable test solutions. The instruction in course 25 occupies four or five hours weekly throughout the Senior term, and consists chiefly of laboratory work.

SECOND YEAR'S WORK.

[Upon completion of the Junior and Senior work, pp. 14–18, for the degree of Graduate of Pharmacy the following courses of study are entered upon, occupying one school year, from October 1st to about the middle of June, and leading to the degree of Pharmaceutical Chemist.]

PHARMACY.

26. *The Pharmacy of Organic Chemicals.*—The hydrocarbons and their derivatives, alcohols, ethers, aldehydes, ketones, chloroform, iodoform, chloral, organic acids, and the newer remedies of organic chemistry, such as antipyrine, acetanilid, salol, sulfonal, etc.

27. *The Pharmacy of the Digestive Ferments.*—Diastase, pepsin, pancreatin, etc.

28. *The Chemical Constituents of Plant Drugs and Animal Drugs.*—The preparation of organic drugs.

29. *The Pharmacopœias of the World.*—Comparative study of their materia medica, pharmacy, nomenclature, and other important features, respectively.

30. *Miscellaneous Technical Subjects* connected with the practical work required of pharmacists and pharmaceutical chemists.

Oxidation, reduction, fermentation, and other chemical processes inimical to medicinal substances. The preservation of drugs and medicines.

The production of various classes of pharmaceutical preparations not considered under other heads.

Soaps, perfumery, toilet preparations and other products related to pharmacy and sanitation.

CHEMISTRY.

31. *Physical Chemistry.*—A course of about twenty-five lectures is given on topics selected from Physics and Physical Chemistry, and chiefly in the departments of light, heat and electricity. This course will be practical rather than theoretical in nature, and will deal not only with the application of physical methods to the solution of Chemical problems, but will take up, somewhat in detail, the discussion of several of the more important chapters of Physics concerning the construction and use of optical and electrical apparatus employed by chemists and physicians.

32. *Physiological Chemistry.*—A course of twenty-five lectures is given on topics of practical interest in the field of elementary physiological chemistry. Especial attention is devoted to the subject of foods and the processes and products of digestion. The tests and characteristic reactions of many important compounds are explained and illustrated. This course is followed by a review of the subject of urine analysis.

33. *Special Organic Chemistry.*—A course of twenty lectures is given on the subject of the important synthetic compounds which in the last decade have become an important part of our Materia Medica. In this course the methods of preparation, the characteristic properties, means of identification and structural relations of these bodies are discussed and their oppositions in the general scheme of chemical classification outlined.

APPLIED PHARMACEUTICAL CHEMISTRY.

34. *Preparatory Work.*—The students are required to verify the burettes and pipettes used by them, and instructed how to do so.

They are also required to determine the identity and purity of the reagents and other chemicals, the sensitiveness of their test-paper, and the purity of the filter-paper. Each student must make his own volumetric solutions and prove their correctness. The verification of the indicators used is also included in the preparatory work.

35. *Drug Assaying.*—The valuation of opium, cinchona, nux vomica and other drugs and their preparation. Standardization of plant drugs and galenical preparations of them. Studies of alkaloids and their salts, and the separation of associated alkaloids from each other. Comparisons of different methods. Chemical examinations of plants and plant drugs.

36. *Digestive Ferments.*—Estimation of the value of pepsins, pancreatin, and malt extracts by various methods.

37. *Inorganic Quantitative Analysis.*—Sufficient practice in gravimetric and volumetric methods of analysis of inorganic substances is afforded throughout the course, the lessons and examples chosen for this purpose being such as occur most frequently in the actual practice of pharmaceutical chemists.

38. *Comparisons of Methods.*—Examinations and comparisons of important pharmaceutical and chemical working methods, analytical and synthetical, including the study of some modern remedies and the processes by which they may be prepared.

39. *Water Analysis.*—The examination of drinking water, continued over a period of about three months.

40. *Examinations of Food Products, Etc.*—The examination of flour, bread, butter, milk, oils, tea, coffee, canned products, wines and other spirituous liquors, baking powders, and other similar articles.

41. *Nitrogen Estimations* by different methods.

42. *Toxicological Examinations* in a variety of made-up cases requiring the detection of morphine, strychnine, colchicine, phosphorus, arsenic, mercury, lead, zinc and other poisons.

Accurate and complete records, satisfactory to the Director of the Laboratory, are kept under his supervision by the students themselves, of the facts and results of all examinations made by them. These records are in the form necessary to the acquisition of correct habits of care, precision and reliability in actual practice, and serve to impress upon the student the sense of responsibility which is indispensable in the work of scientific-technical experts.

Courses 34 to 42 inclusive consist wholly of laboratory work, occupying at least twenty-four hours weekly throughout the year.

BOTANY, MICROSCOPY AND PHARMACOGNOSY.

43. *Systematic Botany.*—This course includes the study of the principles and methods of plant classification, the different systems

of classification in use, plant analysis and herborization, and the study of type specimens of each of the principal groups of plants, both cryptogamous and phænogamous. The course consists of lectures, recitations and laboratory work.

44. *Microscopy.*—In this course the optical principles on which the microscope depends will be considered, as well as the microscope itself, the most important pieces of apparatus accessory to the microscope, the methods of collecting, fixing, preserving and hardening vegetable structures for microscopic study, and the methods of imbedding, sectioning, staining and permanently mounting objects. In short, the whole subject of microscopic technology as applied to botany and pharmacognosy is traversed. The course includes lectures, recitations and laboratory exercises.

45. *The Microscopical Examination of Powders, Spices, Food Products, Etc.*—The methods employed. Laboratory instruction in the identification of various substances and tissues, vegetable and animal. A number of the more important drugs are thoroughly investigated as to their microscopic structure, powdered drugs are studied with reference to their identification and the detection of adulterations by microscopic means.

THERAPEUTICS AND TOXICOLOGY.

46. *Therapeutics and Toxicology.*—The classification of medicines according to their general properties and uses; the modes of action of medicines; posology; poisons, symptoms of poisoning, and appropriate antidotes.

BACTERIOLOGY.

47. Course of lectures and laboratory work in Bacteriology are also offered. These courses are elective. Students taking the course for the degree of Pharmaceutical Chemist are strongly urged to avail themselves of the opportunity to include Bacteriology in their work. The lectures on Bacteriology occur twice each week during a period of about twelve to fifteen weeks. The laboratory work continues through about eight weeks with about ten hours' work weekly.

ELECTIVE COURSES.

The laboratories of this school are well equipped for elective courses in urine analysis, chemical and microscopical, toxicology, chemical physiology, general organic analysis, gas analysis, food and water analysis, micro-botany, human histology, bacteriology, and various other lines of work.

PRIZES.

Valuable sets of pharmaceutical apparatus, including forty pieces, together with large assortments of pure ground and powdered drugs, in pound and half-pound packages, are offered by Messrs. Gilpin, Langdon & Co., of Baltimore, as prizes for the best work performed in the pharmaceutical laboratories. This prize is awarded to one member of each graduating class.

TEXT-BOOKS AND BOOKS OF REFERENCE.

Certain books are necessarily adopted as the principal text-books, in order that students may be able to keep up with their studies without difficulty. These books are selected by the Faculty as being the best for the students, and in harmony with the courses of instruction. Students will therefore find it to their advantage to use these books in preference to others.

Pharmacy—The United States Pharmacopœia, Seventh Revision; Oldberg's General Principles of Pharmacy; Weights and Measures; Pharmaceutical Problems; 1,500 Prescriptions.

Laboratory Manual of the Inorganic Pharmaceutical Preparations.

Chemistry—Roscoe's Chemistry; Long's Elementary Course in Experimental and Analytical Chemistry; Remsen's Organic Chemistry; Long's Physiological Chemistry.

Botany and Pharmacognosy—Bastin's College Botany; Maisch's Organic Materia Medica.

Applied Pharmaceutical Chemistry—Fresenius' Analytical Chemistry; Flückiger's Reactions, by Nagelvoort.

The necessary text-books can be obtained at the school.

Works of Reference—Companion to the United States Pharmacopœia; National Dispensatory; United States Dispensatory; Remington's Practice of Pharmacy; Oldberg's Outline of a Course in Pharmacy; Prescott's Organic Analysis; Flückiger & Hanbury's Pharmacographia; Roscoe & Schorlemmer's Chemistry.

EXPENSES.

The *Matriculation Fee*, payable only once, is $5.

Tuition Fees—The tuition fees for each school term of the course for the degree of Graduate in Pharmacy (one term extending from about the first of September to the first of February, and another from the first of February to the middle of June) are $75.

The first year's studies for the degree of Pharmaceutical Chemist being the same as those for the degree of Graduate in Pharmacy, covering two school terms, as described above, the fees are the same.

The fees for the second year's studies (courses 26 to 46), for the degree of Pharmaceutical Chemist (extending from about the first of October to the middle of June), are $100.

The fees for the several courses, Junior or Senior, when taken separately, are as follows :

Lecture Course in Pharmacy, - - -	$15.
Lecture Course in Chemistry - - -	15.
Lecture Course in Physiology, - - -	5.
Lecture Course in Therapeutics, - -	5.
Botany, including laboratory work, - -	15.
Pharmacognosy, including laboratory work, -	15.
Laboratory Course in Pharmacy, - - -	15.
Laboratory Course in Chemistry, - -	15.
Laboratory Course in Dispensing, - - -	10.
Special Course in Bacteriology, - -	15.

Tickets sold to any courses of instruction are not transferable, and cannot be exchanged or returned.

The *Diploma Fee* is $5.

Laboratory Deposit—Chemical and pharmaceutical apparatus and implements, microscopes and other apparatus necessary for the work are furnished by the College for the use of every student free of charge, but for this reason a laboratory deposit of $10 must be made by each student at the beginning of the term ; this deposit, or such balance of it as may remain after deducting the value of articles lost, damaged, or destroyed, is returned.

Incidentals—Books, note-books, stationery, laboratory aprons, towels, filter-paper, and any other articles not included in the outfits of apparatus or not returnable, and materials consumed in the laboratories, are furnished to the students at cost.

Board and Room—VERY GOOD BOARD AND ROOM in Chicago cost from $4 to $6 per week; nearly all students obtain them at $5. By rooming together many students are able to reduce the cost to $4.50 or even less. Information as to reliable boarding places is given at the College office for the benefit of students not familiar with the city.

SELECTION OF SEATS AND LABORATORY TABLES.

Lecture-Room Seats and *Laboratory Tables* are assigned to the students at the beginning of the school session, and not before; and the assignments are made in the order in which the students have paid the matriculation fee or the laboratory deposit. The same order is observed in assigning students to the several sections of each class. It is, therefore, of decided advantage to the student to forward that fee ($5) or deposit ($10) at as early a day as practicable. It should be sent to Mr. H. P. Hendricks, 2429 Dearborn Street, Chicago.

Those desiring further information in regard to the School of Pharmacy should address Professor Oscar Oldberg, the Dean of the School, 2421 Dearborn Street, Chicago, Illinois.

MATRICULATES—1895–96.

COURSE FOR THE DEGREE OF PHARMACEUTICAL CHEMIST.

Dorr, Edward Williams....Austin, Minn.
Germer, James William...........Chicago
Kirkpatrick, William...Cambridge, Ohio.
Lisle, Howard Cochran....Springfield, O.
Macy, Sherman Riley.....Des Moines, Ia.
Ossaward, Cornelius....Kalamazoo, Mich.
Porterfield, Elmo Pattin.................. Cape Girardeau, Mo.
Rowe, Alexander Oakley.................. Sioux Falls, S. Dak.
Toomey, Thomas John...........Chicago
Whitehead, Bower Thomas............... Brockings, S. Dak.
Wilde, Ferdinand Albert, Jr.............. Milwaukee, Wis.
Woolsey, Jesse Francis.....Knoxville, Ill.
Wright, Frank.............Somonauk, Ill.

COURSE FOR THE DEGREE OF GRADUATE IN PHARMACY.

SENIORS.

Albright, Cooper...........Hastings, Neb.
Alford, Edward True........Waterloo, Ia.
Allen, Robert Ezra.........Ridgeway, Ia.
Anderson, Charles August................ Litchfield, Minn.
Anderson, Charles Albert,.................. Union Grove, Wis.
Anderson, John William..........Chicago
Bamborough, Claude Edward....Polo, Ill.
Bartz, Edward Rudolph. Charles City, Ia.
Bauman, Louis Christian..St. Joseph, Mo.
Beck, Francis Berry.........Portland, Me.
Beeson, Otis Jesse..........Redfield, Mich.
Benthall, Eugene................. Chicago
Beyer, Arthur Edwin......Edgewood, Ia.
Bishop, Ernest.............Hoopeston, Ill.
Blanchard, Charles B......Edgewood, Ia.
Blish, Gregory Emerson.....Portland, Me.
Borden, Frank Runcorn...Plainfield, Wis.
Breaid, Robert Vivyan.......Savanna, Ill.
Brines, Paul Clinton.........Rushville, Ill.
Brinkman, Oscar Christian.......Chicago
Brown, Fred J.............La Grange, Ind.
Bunn, Arthur Isaac..........Waterloo, Ia.
Butcher, John..............Eddyville, Ia.
Byrud, John..................... Chicago
Campbell, William Linn.......Byron, Ill.
Caryl, John Alexander....Norwich, Conn.
Chittenden, Horace Walter............... Mound City, Mo.
Collins, Albert Roy...........Tracer, Ia.
Copeland, Frederick William............. Scotsburg, Ill.
Corgan, Edgar Clinton......Tamaroa, Ill.
Crothers, Louise M......Bloomington, Ill.
Cupler, Ralph Clinton.............Chicago
Da Costa, Albert Raphael, Jr......Chicago
Davis, Walter Scott........La Grange, Ga.
Delaney, John Patrick.........Marcus, Ia.
Demaray, Charles Howard......Osage, Ia.
Dennis, John Cross...Cape Girardeau, Mo.
Dick, John William.........Madison, Wis.
Donovan, Timothy Morrissey............. Graceville, Minn.
Dow, John Peter........Georgetown, Mo.
Egler, William Frederick................. Defiance, Ohio.
Evans, Ira Ellsworth.......Plainfield, Ill.
Faris, Melville Arthur..Bloomington, Ill.
Farnsworth, Julius Mellen........Chicago
Forsyth, Francis, Jr............Dixon, Ill.
Fox, Vincent Augustine...........Chicago
Freund, George Washington......Chicago
Fussey, Alfred Louis........Lincoln, Neb.
Gatzman, Eva Katherine.................. Minneapolis, Minn.
Gerner, Thorvald Levin...........Chicago
Giller, Frank Eugene......Whitehall, Ill.
Glazebrook, Milton Bradford.............. Kenney, Ill.
Gleeson, Benjamin Michael............... Blue Mound, Ill.
Godfrey, Andrew Ellwood................ Whitewater, Wis.
Goll, Bruno Henry, Jr.............Chicago
Goodman, Charles Wilbur................ Patch Grove, Wis.
Grant, Albert Clayton..................... St. Thomas, N. Dak.
Grassly, William Lewis..Jacksonville, Ill.
Graves, Clarence Ambrose........Chicago
Green, Mary Theresa..............Chicago
Greenwell, Benjamin Ernest.............. Farmington, Ill.
Gretter, William Cecil.................... Pacific Grove, Cal.
Gries, Henry Andrew.......Wabash, Ind.
Grisdale, Charles............Whiting, Ind.

Halbkat, Franklin Walter................. Spring Valley, Minn.
Halsell, Oliver Linden...Santa Anna, Cal.
Hamil, Grace Adelaide......Wayland, Ia.
Hansen, Otto Theodore........Walnut, Ia.
Hanson, Eugene Waldron...San Jose, Cal.
Harwood, Miner Flower...... .... Strawberry Point, Ia.
Henton, Clarence Henry.....Otsego, Wis.
Heper, Carl.......................Chicago
Hill, Frank Albert.............Ottawa, Ia.
Holbrook, Newell Thomas................ Carthage, Mo.
Howard, Agnes May........Boston, Mass.
Johnson, Albert Hoover..Glendive, Mont.
Jones, Frank Knight..........DeWitt, Ia.
Jones, Hugh Owen................Chicago
Kilvary, Robert Daniel...........Chicago
Kline, Mary.........................Chicago
Knapp, George Dennis........Grant, Neb.
Knuth, William Lewis..Springfield, Ohio
Koch, Robert August John.......Chicago
Krizan, William..................Chicago
Kuhn, Anthony Edward....Tiskilwa, Ill.
Lander, Charles Joe.....Marshalltown, Ia.
Leenheer, Cornelius Arthur......Chicago
Lomax, John Alfred..............Chicago
MacRae, John Livingston................. Escanaba, Mich.
Magee, Samuel Reuben...........Chicago
Marsh, Olander Shirley................... Winchester, Ind.
Marshall, E. B....................Chicago
Marshall, Oliver Ernest....Mt. Morris, Ill.
McComas, Joshua Lee......Oakland, Md.
McDermott, Cornelius Lewis.............. Waterloo, Ia.
McDermott, June............Le Roy, Ohio
McDougal, Harry Hubbard....Peoria, Ill.
McLean, John Sharp..................... Hackettstown, N. J.
Meier, Albert Oscar......Milwaukee, Wis.
Meloan, Robert Wells.....Monmouth, Ill.
Mercer, Glenn Henry..........Liberty, Ill.
Mercer, William Elmer........Liberty, Ill.
Meyer, John Ludvig Engh........Chicago
Meyer, Otto Frederick...Sheboygan, Wis.
Miller, Harvey Franklin.................. Harrodsburg, Ky.
Morris, William Clayborne................ Temperance, Ky.
Mulvey, James................Loyal, Wis.
Munger, Don Marshal.......Waterloo, Ia.
Murbach, John Edward..........Chicago
Nelson, John Frederick..Rock Island, Ill.
Neufeld, Frank...........Rock Island, Ill.
Novak, Charles Joseph............Chicago
Ohrenstein, Rudolph Angel......Chicago
O'Keefe, Charles Joseph....Minto, N. Dak.
Ordway, John Cuykendall..Auburn, N. Y.
Orr, Alexander L...............Mystic, Ia.
Ott, Clare Allen..........Mt. Pleasant, Ia.
Palmer, Fred Everett.........Sparta, Wis.
Palmer, John Wesley.........Sparta, Wis.
Patterson, William Morris................ Mansfield, Ill.
Paull, Stephen Collins....Calumet, Mich.
Paxson, Loren Custer........Butte, Mont.
Perrigo, William Solomon................ Lake Geneva, Wis.
Peterson, Frank William....Donovan, Ill.
Pfeiffer, Charles..................Chicago
Phalen, John William.......Harvard, Ill.
Pinney, Harry Henderson........Chicago
Pond, Henry Warner......Granville, Ohio
Rice, William Hawley............Chicago
Rockwood, Edmund Franklin............ Cottonwood Falls, Kan.
Rohrlack, Otto...........Reedsburg, Ohio
Rummel, Abdeile.................Chicago
Rund, James.......................Chicago
Rutherford, Archibald Emmett........... Edmeston, N. Y.
Ryder, Louis Wadsworth................. New Haven, Conn.
Salter, Chalmer Newton....Kirkwood, Ill.
Sanger, Walter Lee...........Lowell, Ind.
Sayre, Charles Alexander................ Marietta, Ohio
Schreiber, Darwin..........Tell City, Ind.
Seaman, John Martin.................... Livingston, Mont.
Seaman, Mary Eleanor.................... Kilbourn City, Wis.
Siebel, Frederick Peter...........Chicago
Snyder, Clayton Johnson....Cherokee, Ia.
Sourwine, Arra Zelotus..Escanaba, Mich.
Stock, Theodore William......El Paso, Ill.
Stone, Lewis Ledman.......Centralia, Ill.
Sullivan, Daniel James...........Chicago
Sutton, Charles Edward..........Chicago
Swan, Earl Chandler...........Elgin, Ill.
Sweet, William Herbert.................... Minneapolis, Minn.
Terpenny, Walter James..........Chicago
Theller, Frank Pioche......Oakland, Cal.
Thorelius, Oscar David...........Chicago
Town, Elnathan...............Easton, Ill.
Trowbridge, Leslie James................ Marseilles, Ill.
Turnquist, Carl Martin...........Chicago
Viall, Fay Burke....Spring Valley, Minn.
Walker, William Glenn....Los Gatos, Cal.
Wenzel, John Valentine....La Crosse, Wis.
White, Henry Kirk......Whitewater, Wis.
Wing, Franklin Benjamin................. Whitehall, Wis.
Witt, Matthias Henry......Abilene, Kan.
Woolston, Alvah Stevens....Clinton, Wis.
Wrixon, Thomas William, Jr......Chicago

JUNIORS.

Albright, Cooper...........Hastings, Neb.
Alford, Edward True ....Waterloo, Ia.
Allen, Robert Ezra..........Ridgeway, Ia.
Anderson, Charles August................ Litchfield, Minn.
Anderson, Charles Albert .... Union Grove, Wis.
Anicker, William John.........Peoria, Ill.
Bamborough, Claude Edward....Polo, Ill.
Barrett, Arthur Eames........Dallas, Tex.
Bartling, Otto ....Chicago
Bauer, Henry John................Chicago
Bauman, Louis Christian .... St. Joseph, Mo.
Beck, Francis Henry........Portland, Me.
Bermelee, George Fred...........Chicago
Betourney, Meddie.........Kankakee, Ill.
Beyer, Arthur Edwin ....Edgewood, Ia.
Bowman, Frank R............St. Joe, Ind.
Brawley, Frank Ellis...........Peoria, Ill.

Breaks, Mrs. Harriet Beecher .... Crawfordsville, Ind.
Brill, Emil G. F....................Chicago
Brinkman, Oscar Christian ....Chicago
Bullock, Arthur George .... Lake Geneva, Wis.
Bunn, Arthur Isaac ....Waterloo, Ia.
Burger, Albert................Oshkosh, Wis.
Burgess, Haller Earnest .... Princeville, Ill.
Caryl, John Alexander....Norwich, Conn.
Casey, James Clyde ....Metropolis, Ill.
Changelon, Constantine Joseph .... Chicago
Chittenden, Horace Walter................ Mound City, Mo.
Coates, Edgar Gordon.............Chicago
Collins, Albert Roy ....Traer, La.
Coombs, Charles Fremont.........Chicago
Copeland, Frederick William .... Scottsburg, Ill.
Corgan, Edgar Clinton.......Tamaroa, Ill.
Crothers, Louise M...... Bloomington, Ill.
Curtis, Charles Gilbert ....Chicago
Da Costa, Albert Raphael ....Chicago
Delany, John Patrick..........Marcus, Ia.
Delzell, Charles Alpheus..... Fairfield, Ill.
Demaray, Charles Howard ......Osage, Ia.
Dennis, John Cross ...Cape Girardeau, Mo.
Dow, John Peter ....Georgetown, Mo.
Drab, Frank.......................Chicago
Duncan, Ogden Greenough..Marshall, Ill.
Edmonston, Thomas Franklin .... Camargo, Ill.
Egler, William Frederick...Defiance, Ohio
Eichelberger, Jesse Lee ....Pana, Ill.
Eliers, Gustav Herman......Oshkosh, Wis.
Fields, Walter Brooks.........Atlanta, Ill.
Fiss, Franklin Benjamin .... Charles City, Ia
Fitzgerald, Edwin Gerald .... Shelbyville, Ill.
Fitzpatrick, James Francis ....Chicago
Flack, Will Edgell ....Elkhorn, Wis.
Flecksteiner, William John............... Dayton, Ohio
Frantz, Elmer ....Danville, Ill.
French, Charles Brainard ...Maxwell, Pa.
Freund, George Washington ......Chicago
Funk, William Bernard ....Chicago
Furlong, William Rufus...........Chicago
Fussey, Alfred Louis ....Lincoln, Neb.
Gatzman, Eva Katharine.................. Minneapolis, Minn.
Glazebrook, Milton Bradford............. Kenney, Ill.
Gleeson, Benjamin Michael............... Blue Mound, Ill.
Godfrey, Andrew Ellwood................ Whitewater, Wis.
Golembiewsky, Julyan....... ....Chicago
Goll, Bruno Henry, Jr.............Chicago
Goodman, Charles Wilbur................. Patch Grove, Wis.
Grassly, William Lewis...Jacksonville, Ill.
Green, Don Roy ....Effingham, Ill.
Green, Mary Theresa..............Chicago
Griffin, David James ....Clare, Ia.
Grisdale, Charles............Whiting, Ind.
Haanshuus, John Wilhelm ....Chicago
Halbkat, Franklin Walter .... Spring Valley, Minn.
Hall, Louis Pratt.........Red Creek, N.Y.
Hansen, Otto Theodore........Walnut, Ia.
Hardt, Harry Godfrey Ferdinand .... Chicago
Harwood, Miner Flower................. Strawberry Point, Ia.
Hathaway, Henry Claten.....St. Joe, Ind.
Hemming, Ensign Alfred Michael .... Janesville, Wis.
Henton, Clarence Henry......Otsego, Wis.
Heper, Carl ....Chicago
Heyden, Otto.......................Chicago
Hill, Frank Albert ....Ottawa, Ill.
Hillman, James Ferguson.....Walnut, Ia.
Hogan, John Joseph ....Lake City, Ill.
Holbrook, Newell Thomas..Carthage, Mo.
Howard, Agnes May.........Boston, Mass.
Hughes, Evan John ....Cambria, Wis.
Jennings, Henry Joseph....Defiance, Ohio
Johnson, Edward Scott....Harrisburg, Ill.
Jones, Mrs. Carolina Allen........Chicago
Jones, Charles H......... Dodgeville, Wis.
Jones, Frank Knight............DeWitt, Ia.
Kilvary, Robert Daniel............Chicago
Kline, Mary.......................Chicago
Klink, Will B..................Arcola, Ill.
Knapp, George Dennis ....Grant, Neb.
Knapp, James Bertrand, Jr............. Randolph, Ill.
Knuth, William Lewis...Springfield, Ohio
Koch, Robert August John ....Chicago
Krizan, William...................Chicago
Lander, Charles Joe ....Marshalltown, Ia.
Lee, Henry Cooley ....Chicago
Leenheer, Cornelius Arthur.......Chicago
Lemon, Fred Wiliits............Aleda, Ill.
Lepper, Mrs. Hennie H............Chicago
Lindberg, Carl Victor....Red Wing, Minn.
Liska, Anton......................Chicago
Lomax, John Alfred ....Chicago
Lossie, William Theodore.........Chicago
Low, James Fred ....Atlantic, Ia.
Lowman, Alexander Blackburn .... Macomb, Ill.
Macer, Charles Wilburne..Lynnville, Ind.
Magee, Samuel Reuben ....Chicago
Magnussen, Albert............Lansing, Ia.
Marsh, Orlando Shirley..Winchester, Ind.
McDermott, Cornelius Louis..Waterloo, Ia.
McDermott, June.............LeRoy, Ohio
McLean, John Sharpe.................. Hackettstown, N. J.
McRoberts, Charles ......Mound City, Mo.
Mehring, August William.........Chicago
Meier, Albert Oscar.. ....Milwaukee, Wis.
Meloan, Robert Wells......Monmouth, Ill.
Mercer, Glenn Henry... ......Liberty, Ill.
Meyer, John Ludvig Engh. ...... Chicago
Meyer, Otto Frederick... Sheboygan, Wis.
Milles, Harry................. ......Chicago
Milligan, Frank Goss......Markesan, Wis.
Moore, Clarence James........Manson, Ia.
Morris, William Clayborne............... Temperance, Ky.
Nelson, John Frederick..Rock Island, Ill.
Neufeld, Frank...........Rock Island, Ill.
Northrup, Walter Henry..... .... Crown Point, Ind.
Novak, Charles Joseph........... Chicago
O'Keefe, Charles Joseph..Minton, N. Dak.
Ott, Clare Allen.......... Mt. Pleasant, Ia.
Palmer, John Wesley... ......Sparta, Wis.
Paull, Stephen Collins.... Calumet, Mich.
Paxson, Loren Custer........Butte, Mont.
Perrigo, William Solomon................ Lake Geneva, Wis.

Pfeiffer, Charles..................Chicago
Phalen, John William.......Harvard, Ill.
Pitzer, Enoch Spradling.......... Chicago
Pond, Henry Warner...... Granville, Ohio
Pruitt, Frank Austin......Wellington, Ill.
Radke, George Julius....Manistee, Mich.
Redden, Edward Ned.............Chicago
Reynolds, Frank Waldo.......... ....Chicago
Rice, William Hawley............Chicago
Richmann, Frederick Alexander........ Elgin, Ill.
Roberts, Harold Hargreaves .... Albion, Neb.
Robinson, Claude Woodmansee.......... Davis City, Ia.
Rockwood, Edmund Franklin............ Cottonwood Falls, Kas.
Rogan, James Edward..........Joliet, Ill.
Rogers, Walter Erastus....Port Byron, Ill.
Rummel, Abdeile................Chicago
Ryder, Louis Wadsworth................. New Haven, Conn.
Salter, Charles Newton....Kirkwood, Ill.
Sanger, Walter Lee............Lowell, Ind.
Sayre, Charles Alexander................ Marietta, Ohio
Schaefer, Charles Frederick......Chicago
Schelling, Ernest C........Mt. Morris, Ill.
Scott, Ingvard Martinius..........Chicago
Sexton, William Thomas......Leland, Ill.
Sipp, James D..............LaGrange, Ill.
Sloan, Victor Alan................Chicago
Snyder, Clayton Johnson....Cherokee, Ia.
Staga, August Herman............Chicago
Stock, Theodore William......El Paso, Ill,
Stone, Lewis Ledman........Centralia, Ill.
Strenzke, Theodore Arthur............... St. James, Neb.
Strickland, Bert Wilson......El Paso, Ill.
Sweet, William Herbert.................. Minneapolis, Minn.
Thomas, Joseph Fuller..........Chicago
Thompson, Thomas Alfred...Albion, Neb.
Thompson, Charles Reuben.............. Grayslake, Ill.
Thorelius, Oscar David............Chicago
Trobaugh, William Hale..... .... Murphysboro, Ill.
Trowbridge, Leslie James................ Marseilles, Ill.
Vaill, Fay Burke....Spring Valley, Minn.
Veistenz, Rudolph Ferdinand............ Arthur, N. Dak.
Weckler, George Mike............Chicago.
Wenzel, John Valentine....LaCrosse, Wis.
White, Henry Kirk......Whitewater, Wis.
Whyte, George M............Alma, Mich.
Wing, Franklin Benjamin................ Whitehall, Wis.
Woolston, Alva Stevens......Clinton, Wis.
Witt, Mathias Henry........Abilene, Kas.
Zinngrabe, John Joseph..........Chicago.

SPECIAL STUDENTS.

Casey, James Clyde........Metropolis, Ill.
Funk, William Burnard ....Chicago
Green, Don Roy............Effingham, Ill.
Haanshuus, John Wilhelm......Chicago
Nankervis, Henry......Ishpeming, Mich.
Redden, Edward Ned...........Chicago
Whitney, Mabelle Berdena................ Manchester, Ia

HONORS — 1895 AND 1895–96.

SENIORS.

Ernest Francis Knapp, '95. University Medal.
Howard Cochran Lisle, A. B., '95.
Frank Wright, '95.
Frank Runcorn Borden, '95-'96.
John Byrud, '95-'96.
John Cuykendall Ordway, '95-'96.

JUNIORS.

Walter Scott Davis, '95. Junior Prize.
Francis Berry Beck, '95-'96.
Franklin Walker Halbkat, '95-'96.
John Wesley Palmer, '95-'96.
Charles Alexander Sayre, '95-'96.

The Gilpin, Langdon and Company Prize was awarded to James William Germer, Class of 1895, and to Otis Jesse Beeson, Class of 1895-'96.

GRADUATES — 1895-96.

DEGREE OF PHARMACEUTICAL CHEMIST.

Griswold, Viola A., Ph. G., Chicago. Assistant in the Pharmaceutical Laboratory, N, W. U. School of Pharmacy.
Patterson, Charles Waggener, Ph. G., Chicago. Instructor in the Dispensing Laboratory, N. W. U. School of Pharmacy.
Sturm, Arthur Bernard, Ph. G., Chicago. Instructor in the Department of Botany and Pharmacognosy, N. W. U. School of Pharmacy.

DEGREE OF GRADUATE IN PHARMACY.

Alderson, Miles, Strawberry Point, Ia. Practicing in Strawberry Point.
Anderson, Seymour Sheldon, Terre Haute, Ind. In business for himself at Terre Haute.
Arno, Edward Charles, Freeport, Ill. Practicing in Freeport.
Atterbery, Marion Ott, Oakford, Ill. In business for himself at Oakford.
Bailey, Charles Whitney, Hebron, Ill. Located at Hebron.
Bailey, Edward Burke, Demopolis, Ala. Practicing at Demopolis.
Bailey, Timothy Cornish, Demopolis, Ala. Practicing at Demopolis.
Baker, Bert William, So. Whitley, Ind. Practicing in Mulberry Grove, Ill.
Barnes, Lloyd Moine, Strawberry Point, Ia. Located at Strawberry Point.
Bartels, Henry John, Marshfield, Wis. Located at Marshfield.
Bartz, Edward Rudolph, Charles City. Practicing at Charles City.
Battles, John French, Dillsburgh, Ill. In business for himself at Lowell, Mass.
Baumann, Charles Rudolf, Racine, Wis. Practicing at Racine.
Beeson, Otis Jesse, Redfield, Mich. Received the Gilpin, Langdon and Company Prize. Located at Redfield.
Benesh, Vaclav, Cedar Rapids, Ia. In business for himself at Cedar Rapids.
Best, George Herman, Peoria, Ill. Practicing in Peoria.
Bickenbach, Alvin Paul, Freeport, Ill. In business for himself at Elgin, Ill.
Bissell, James Rockefeller, Fayette. Ia. In business for himself at South Bend, Ind,
Blanchard, Charles B., Edgewood, Ia. Practicing in Edgewood.
Blish, Gregory Emerson, Portland, Me. Practicing in Chicago.
Bodie, Howard Eugene, York, Neb. Located in York.
Borden, Frank Runcorn, Plainfield, Wis. Located in Plainfield.
Brassie, Francis William, Olney, Ill. Located in Olney.
Breaid, Robert Vivyan, Savanna, Ill. Located at Savanna.
Breister, William Walter, Fond du Lac, Wis. Practicing in Fond du Lac.
Brines, Paul Clinton, Rushville, Ill. Practicing in Rushville.
Brown, Earnest Irwin, Brown's Valley, Minn. Practicing at Brown's Valley.
Brown, Fay, Crescent City. Practicing at Crescent City.
Brown, Fred J., La Grange, Ind. Practicing at La Grange.
Brown, William Mott, Earlville, Ill. Practicing at De Kalb, Ill.
Bruhn, Julius Fred, New Holstein, Wis. Practicing in Chicago.
Buck, Albert Haines, Chicago. In business in Chicago.
Butcher, John, Eddyville, Ia. Practicing in Knoxville, Ia.
Byrud, John, Chicago. Practicing in Chicago.
Campbell, George Alfred, Pullman, Chicago. Practicing in Pullman.
Campbell, William Linn, Byron, Ill. Practicing in Byron.
Candler, Gustave Adolph, Cassville, Wis. Located in Cassville.
Canney, Arthur Dolan, Chicago. Practicing in Chicago.
Carter, Harden Hasten, Wenona, Ill. Practicing in Effingham, Ill.
Clark, Thomas Henry, Otterville, Mo. In business for himself at Otterville.
Clemens, Will Coleman, Keota, Ia. Practicing in Keota.
Conrad, Louis John, Chicago. Practicing in Chicago.

Constantine, Pehr Adelbert, Red Wing, Minn. Located in Eau Claire, Wis.
Cook, Lon, Greencastle, Ind. Practicing in Greencastle.
Cook, William Wallace, Irving Park, Ill. Located in Irving Park.
Cowles, George Henry, Elkhorn, Wis. Located at Elkhorn.
Cupit, Thomas, Park City, Utah. Practicing in Chicago.
Curtice, William D., Shannon, Ill. Practicing in Chicago.
Cutter, Scott Clay, Oswego, Ill. Practicing in Oswego.
Davenport, Guy, Mer Rouge, La. Located in Mer Rouge.
Davis, Charles Rowe, Charleston. Ia. Located in Charleston.
Dick, John William, Madison, Wis. Practicing in Chicago.
Dohrmann, William Edward, Eau Claire, Wis. Located in Eau Claire.
Dorr, Edward Williams, Austin, Minn. In attendance on the course for the degree of Pharmaceutical Chemist, N. W. U. School of Pharmacy.
Duncan, James Henry, Decorah, Ia. Practicing in Chicago.
Dyer, William Henry, Sycamore, Ill. Practicing in Sycamore.
Duskek, Joseph Frank, Chicago. Practicing in Chicago.
Ellis, Frederick Herbert, Alfred Center, N. Y. Located at Nebraska City, Neb.
Engelson, Christian Johan, Brookings. S. Dak. Located at Brookings.
Erickson, Charles August, Salina, Kan. Practicing in Chicago.
Evans, Ira Ellsworth, Plainfield, Ill. In business at Plainfield.
Ewen, William W., Rossville, Ill. Practicing in Rossville.
Ewers, William Vaux, M. D., Sackett's Harbor, N. Y. Practicing medicine in Rochester N. Y.
Fairchild, Joseph Berton, De Smet, S. Dak. Practicing at Castlewood, S. Dak.
Farnsworth, Julius Mellen, Chicago. In business for himself in Chicago.
Fischer, Carl Frank, Kewanee, Ill. Practicing in Chicago.
Fleming, Joanna Angela, Bement, Ill. Located in Chicago.
Forsyth, Francis, Jr., Dixon, Ill. Practicing in Dixon.
Foster, Herbert Ellsworth, Toledo, Ia. Practicing in Toledo.
Fox, Vincent Augustine, Chicago. Practicing in Chicago.
Frank, Gustav, Chicago. Located in Chicago.
Frick, Edward Louis, Jr., Audubon, Ia. Located in Chicago.
Germann, Alphonso Francis, Burlington, Wis. Located in Burlington.
Germer, James William, Chicago. Received the Gilpin, Langdon & Co. Prize. In attendance upon the course for the degree of Pharmaceutical Chemist, N. W. U. School of Pharmacy.
Gerner, Thorvald Lavin, Chicago. Practicing in Chicago.
Giller, Frank Eugene, Whitehall, Ill. Practicing in Chicago.
Grant, Albert Clayton, St. Thomas, N. Dak. Located in St. Thomas.
Greenough, George Arthur, Pender, Neb. In business for himself at Pender.
Greenwell, Benjamin Ernest, Farmington, Ill. Practicing at Galesburg, Ill.
Gries, Henry Andrew, Wabash, Ind. Practicing in Salt Lake City, Utah.
Grimes, John Patrick, Chicago. Located in Chicago.
Haas, George, Butler, Ill. Located in Butler.
Hanley, Herbert Russell, Paxton, Ill. Located in Paxton.
Hansen, Nels Louis, Chicago. Practicing in Chicago.
Hanson, Louis M., Canton, S. Dak. Practicing at Canton.
Hatcher, Thomas Gale, Norborne, Mo. Located in Liberty, Mo.
Henderson, Oliver Maxfield, Greenfield, Ill. Practicing in Minneapolis, Minn.
Hillemann, Charles Herman, Arlington, Minn. Practicing at Green Isle, Minn.
Hinman, Willis Townsend, Cambridge, Ill. Located at Galesburg, Ill.
Hoeser, August William, Durand, Wis. Practicing at Durand.
Hofmeister, John Ernie, Memphis, Tenn. Located at Memphis.
Jaeger, Carl Conrad, Madison, Wis. Located at Mendota, Wis.
Jeffrey, Frank Dana, Clarinda, Ia. Practicing in Clarinda.
Johannes, Philip, Chicago. Practicing in Chicago.
Johnson, Edwin Samuel, Sterling, Ill. Located in Sterling.
Johnson, Harry Stephen, Racine, Wis. Located in Racine.
Jones, Alfred Julius, Iron Mountain, Wis. Located in Iron Mountain.
Jones, Hugh Owen, Chicago. Practicing in Chicago.
Kastner, Ferdinand, Wall Lake, Ia. Practicing at Wall Lake.
Keep, Archibald Rush, Meadville, Pa. Practicing in Meadville.
Kent, Charles Franklin, Union City, Mich. Located in South Chicago.
Kerfoot, John Edwin Brewster, Drayton, N. Dak. Located in Drayton.
Kirkpatrick, William, Cambridge, O. In attendance on the course for the degree of Pharmaceutical Chemist, N. W. U. School of Pharmacy.
Knapp, Ernest Francis, Chicago. Practicing in Chicago.
Kraker, John Lewis, Shannon, Ill. Located in Chicago.
Kreidler, Louis Christian, La Porte, Ind. Located in La Porte.
Kuhn, Anthony Edward, Tiskilwa, Ill. Practicing in Henry, Ill.
Lander, Frank Edward, Danvers, Ill. Practicing in Danvers.
Leake, Frank Elmer, Dixon. Ill. Located in Dixon.
Lenz, Joseph Alvin, Dubuque, Ia. Located in Dubuque

Lewis, Thomas Edward, Wheeling, W. Va. Located in Wheeling.
Lisle, Howard Cochran, A. B., Springfield, O. In attendance on the course for the degree of Pharmaceutical Chemist, N. W. U. School of Pharmacy.
McRae, John Livingston, Escanaba, Mich. Located at Escanaba.
Marsh, Harrie Boltwood, Bowen, Ill. Practicing at Bowen.
Marshall, Oliver Ernst, Mt. Morris, Ill. Practicing at Mt. Morris.
Massarek, Herman, Chicago. Practicing in Chicago.
Massenburg, Lou, Freeport, Ill. In business for herself at Council Bluffs, Ia.
Matthews, Burt Earl, Wayne, Mich. In business for himself at Glendive, Mont.
McCoy, George Walter, Bedford, Pa. Practicing at Hyndman, Pa.
McCoy, Michael James, Somira, Wis. Located in Waukesha, Wis.
McDougall, Harry Hubbard, Peoria, Ill. Located in Peoria.
Means, Ora W., Shelbyville, Ind. Located in Indianapolis, Ind.
Mehl, Henry Paul John, Chicago. Practicing in Chicago.
Menge, Herman Christian, Racine, Wis. Practicing in Chicago.
Mercer, William Elmer, Liberty, Ill. Practicing in Liberty.
Miller, Harvey Franklin, Harrodsburg, Ky. Located in Harrodsburg.
Mank, Wilfred Grove, Plymouth, Wis. Practicing in Plymouth.
Morrison, Clinton James. Grand Ridge, Ill. Located in Chicago.
Munger, Don Marshal, Waterloo, Ia. Practicing in Waterloo.
Murray, Eugene Wilson, Syracuse, N. Y. Practicing in Syracuse.
Naffziger, Armand, Marcus, Ia. Practicing in Chicago.
Nankervis, Henry, Ishpeming, Mich. In attendance at the course for the degree of Pharmaceutical Chemist, N. W. U. School of Pharmacy.
Ordway, John Cuykendall, Auburn, N. Y. Located in Chicago.
Orr, Alexander L., Mystic, Ia. Located in Mystic.
Palmer, Fred Everett, Sparta, Wis. Practicing in Sparta.
Patera, Edward, Chicago. Practicing in Chicago.
Patterson, William Morris, Mansfield, Ill. Located in Mansfield.
Pavlik, Otto Steve, Chicago. Practicing in Chicago.
Perkins, Charles Henry, Ottawa, Ill. Practicing in Ottawa.
Peterson, Frank William, Donavan, Ill. Practicing in Donovan.
Peterson, Swan Edward, Atwater, Minn. Practicing at Atwater.
Pierson, James Henry, Oshkosh, Wis. Pharmacist at the Hospital for the Insane, Winnebago, Wis.
Pinney, Harry Henderson, Chicago. Practicing in Chicago.
Porterfield, Elmo Pattin, Cape Girardeau, Mo. In attendance on the course for the degree of Pharmaceutical Chemist, N. W. U. School of Pharmacy.
Powell, Enno Ellerslie, Napoleon, O. Located at Napoleon.
Qualey, Oluf, Ridgeway, Ia. Practicing in Chicago.
Rafferty, Thomas E., Spring Valley, Minn. Located in Spring Valley.
Raquet, Emil Hartman, Aurora, Ill. Practicing in Aurora.
Reinhard, Gustave Christian, Reeseville, Wis. Located in Reeseville.
Rively, Clarence Henry, Chicago. Practicing in Chicago.
Roberts, Will Henry, Ishpeming, Mich. Practicing in Menominee, Mich.
Robinson, Flora, Chicago. Practicing at Vernon, Ill.
Rockefeller, Howard, Anaconda, Mont. Located in Butte, Mont.
Rohrlack, Otto, Reedsburg, Wis. Practicing in Reedsburg.
Rowe, Alexander Oakley, Sioux Falls, S. Dak. In attendance on the course for the degree of Pharmaceutical Chemist, N. W. U. School of Pharmacy.
Royal, Mary Lilly (Mrs. Dr. Rife), Villa Ridge, Ill. In Villa Ridge.
Rutherford, Archibald Emmett, Edmeston, N. Y. Located in Chicago.
Schaper, Henry F., Chicago. Practicing in Chicago.
Seaman, John Martin, Livingston, Mont. Located in Livingston.
Seaman, Mary Eleanor, Kilbourn City, Wis. Practicing in Kilbourn.
Seresse, Francis Julius, Fond du Lac, Wis. Located in Fond du Lac.
Serr, Jacob H., Scotland, S. Dak. Practicing in Chicago.
Siebel Frederick Peter, Chicago. Practicing in Chicago.
Smethurst, Frank Marion, Warren, Ind. In business for himself at Converse, Ind.
Sourwine, Arra Zelotus, Escanaba, Mich. Located in Escanaba.
Starr, Charles Frederick, Chicago. In business for himself in Chicago.
Stephenson, Oscar Clifton, Troy Grove, Ill. Located in Chicago.
Stolte, George William, Reedsburg, Wis. Practicing in Baraboo, Wis.
Stone, Harry D., Albion, Ind. Practicing in Albion.
Sturm, Arthur Bernard, Chicago. Instructor in the Department of Botany and Pharmacognosy, N. W. U. School of Pharmacy,
Sullivan, Daniel James, Chicago. Practicing in Rochelle, Ill.
Sutton, Charles Edward, Chicago. Practicing in Chicago.
Swan, Earle Chandler, Elgin, Ill. Practicing in Chicago.
Theller, Frank Pioche, Oakland, Cal. Located in Chicago.
Thomas, George Washington, Norborne, Mo. Located in Norborne.
Thompson, Roscoe Leon, Colchester, Ill. Practicing at Colchester.
Tidwell, Moody, Crab Orchard, Ill. Located in Harrisburg, Ill.

Toomey, Thomas John, Chicago. In attendance on the course for the degree of Pharmaceutical Chemist, N. W. U. School of Pharmacy.
Topping, William Sidney, Sagaponack, N. Y. In business for himself at Elkhart, Ind.
Town, Elnathan, Easton. Ill. Practicing at Easton.
Turnquist, Carl Martin, Chicago. Practicing in Chicago.
Van Der Veer. Jane, St. Joseph, Mich. In St. Joseph.
Volz, Arthur Gustave, Arlington Heights, Ill. Practicing in Arlington Heights.
Wagner, Guy Watts, Chicago. Studying Medicine at Northwestern University Medical School.
Waite, Raymond Gardner, Charles City, Ia. Located in Chicago.
Walters. John Wesley, Oregon, Wis. Practicing in Oregon.
Walker, Mary Bixby, Reynolds, Ill. Pharmacist in Post-Graduate Medical School Dispensary, Chicago.
Weller, Alexander Jones, Sigourney, Ia. In business for himself at Sigourney.
Wickhorst, Max Henry, Chicago. Chemist, C., B. & Q. R. R. Laboratory, Aurora, Ill.
Wightman, Harrison Pepper, Payton, Utah. In business for himself at Pima, Ariz.
Wilde, Ferdinand Albert. Milwaukee, Wis. In attendance on the course for the degree of Pharmaceutical Chemist, N. W. U. School of Pharmacy.
Woolsey, Jesse Francis, Knoxville, Ill. In attendance on the course for the degree of Pharmaceutical Chemist, N. W. U. School of Pharmacy.
Wright, Frank, Somonauk, Ill. In attendance on the course for the degree of Pharmaceutical Chemist, N. W. U. School of Pharmacy.
Yager, Charles Wilson, Calmar, Ia. In business for himself at Aplington, Ia.
Zangerle, Joseph Arthur, Jr , Chicago. Practicing in Chicago.
Zuber, Anthony Eugene. Chicago. In business for himself in Chicago.

SCHOOL CALENDAR—1896–97.

1896.	
September 1.	Fall Semester begins. Juniors and Seniors admitted.
October 1.	Beginning of second year's studies for the Degree of Pharmaceutical Chemist.
December 22.	Christmas recess begins.
1897.	
January 2.	(Evening) Christmas recess ends.
February 1.	Spring Semester begins. Seniors admitted.
June 17.	Commencement day.
September 2.	Fall Semester begins.
October 1.	Beginning of second year's studies for the Degree of Pharmaceutical Chemist.

From and after the close of the year 1896, Junior students will be admitted only at the beginning of the Fall Semester, and Junior classes will not be admitted in February as heretofore.

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NORTHWESTERN UNIVERSITY

SCHOOL OF PHARMACY

CHICAGO, - ILLINOIS

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CIRCULAR OF INFORMATION

FOR 1899-1900

UNIVERSITY OF ILLINOIS
PRESIDENT'S OFFICE.

Northwestern University Press

NORTHWESTERN UNIVERSITY

The University comprises the following degree-conferring departments, each having a distinct Faculty of Instruction:

The College of Liberal Arts,
The Medical School,
The Law School,
The School of Pharmacy,
The Dental School,
The Woman's Medical School,
The School of Music,
The Schools of Theology.

The departments of the University are situated in Chicago and Evanston, Illinois. The Schools of Medicine, Law, Pharmacy, and Dentistry are established in the former place because of the advantages which a great city affords to those engaged in professional study. The College of Liberal Arts is established in Evanston because of the advantages to be derived from carrying on undergraduate study in a place somewhat removed from the distractions of a large city. The School of Music is also established in Evanston and in close proximity to the College of Liberal Arts. Evanston is the most beautiful suburb of Chicago. It is situated on the shore of Lake Michigan, twelve miles from the center of the city, is tastefully laid out, and is in all respects a model university town. Its population numbers twenty thousand. The charter of the University prohibits the sale of intoxicating liquors within four miles of the University. This provision of the charter is strictly enforced within the city of Evanston. As a result, the place is unusually free from immoral influences. The intelligence and sobriety of the community and the excellent social privileges offered materially aid the University in its work of education.

THE

SCHOOL OF PHARMACY

OF

NORTHWESTERN UNIVERSITY

UNIVERSITY OF ILLINOIS
PRESIDENT'S OFFICE.

(ILLINOIS COLLEGE OF PHARMACY)

CHICAGO

1899–1900

Northwestern University Press

SCHOOL CALENDAR—1899–1900.

1899	
September 25–27.	Registration of Students, Organization of Classes, Assignment of Seats and Tables, and other preliminaries.
“ 28.	Instruction begins.
December 20.	Fall Term ends.
“ 21.	Christmas Recess begins.
1900	
January 3.	Christmas Recess ends.
“ 4.	Winter Term begins.
April 4.	Winter Term ends.
“ 9.	Graduating Exercises. (Ph.G.)
“ 5.	Spring Term begins.
June 20.	Annual Commencement of the University (Graduating Exercises, Ph.C.).
September 23.	Registration of Students for the year 1900-1901.

OFFICERS OF THE BOARD OF TRUSTEES OF THE UNIVERSITY.

WILLIAM DEERING,
President.

THE HON. OLIVER HARVEY HORTON, LL.D.
First Vice-President.

THE HON. H. H. C. MILLER,
Second Vice-President.

FRANK PHILLIP CRANDON, A.M.
Secretary.

ROBERT DICKINSON SHEPPARD, D.D.,
Treasurer and Business Agent.

EXECUTIVE COMMITTEE OF THE SCHOOL OF PHARMACY.

HENRY SHERMAN MAYNARD,
WILHELM BODEMANN,
EZEKIEL HERBERT SARGENT,
THEODORE HENRY PATTERSON, M.D.,
WILLIAM ANDREW DYCHE, A.M., PH.G.

The members of this Executive Committee are experienced Practical Pharmacists, and only Practical Pharmacists of Illinois are eligible as their successors.

FACULTY.

HENRY WADE ROGERS, LL.D.,
President of the University.

OSCAR OLDBERG, PHARM. D., DEAN,
Professor of Pharmacy.

JOHN HARPER LONG, SC. M., SC. D.,
Professor of Chemistry.

WILLIAM EDWARD QUINE, M.D.,
Emeritus Professor of Physiology, Therapeutics, and Toxicology.

ALBERT SCHNEIDER, PH. D., M.D.,
Professor of Botany, Materia Medica and Pharmacography.

DAVID LAKE DAVOLL, JR., SC. B., PH. C.,
Professor of Applied Pharmaceutical Chemistry.

MAURICE ASHBEL MINER, PHARM. M.,
Assistant Professor of Pharmacy; Pharmaceutical Laboratory.

FRANK BURNETT DAINS, SC. M., PH. D.,
Assistant Professor of Chemistry; General Chemical Laboratory.

CHARLES WAGGENER PATTERSON, PH. C.,
Instructor in Dispensing.

VIOLA A. GRISWOLD, PH. C.,
Assistant in the Pharmaceutical Laboratory.

H. P. HENDRICKS,
Clerk.

JESSIE GILMAN HALL,
Stenographer and Librarian.

THE SCHOOL OF PHARMACY.

The services of the scientifically trained pharmacist are necessary to civilization. A man without proper pharmaceutical education has no right to succeed in pharmacy, and he never does succeed in any true sense. He, only, who has received the systematic special training necessary to the proper and effective performance of such duties can safely and successfully verify, test, preserve, prepare, combine, and dispense medicines. The special training referred to can not be attained without the aid of a well-equipped college of pharmacy, and no person seeking the right to practice pharmacy should expect to be able to pass the examinations required by the pharmacy laws unless he has prepared for them by proper pharmaceutical college education. Graduation in pharmacy must soon be demanded by law as a prerequisite to the State license to practice it, for nothing less can satisfy the requirements of enlightened public policy.

SPECIAL NOTICE.

A year ago this school announced that its course for the degree of Graduate in Pharmacy would be lengthened as soon as circumstances permit. This change is now made. Instead of two terms of twenty weeks each, that course will hereafter occupy two annual sessions of six months each, with the student's whole time occupied upon his college work, to the exclusion of concurrent drug-store employment. The tuition fees have, nevertheless, *not* been increased.

THE SCHOOL YEAR

Begins with the last week in September, and all students, Juniors or Seniors, enter the college at that time.

In 1899 the admission and registration of students, organization of classes, assignment of seats and tables, and other preliminaries, begin on September 25th.

Each school year is divided into three terms. For the year 1899-1900 the Fall Term will begin on the 25th of September, and end with the 20th of December, 1899; the Winter Term will begin January 4th and end on the 4th of April, 1900; the Spring Term will begin on April 5th, and end with the University Commencement on the third Thursday (the 20th day) of June, 1900.

Attendance during the Spring Term is not obligatory upon students taking the course for the degree of Graduate in Pharmacy. The graduating exercises of the class completing the course for that degree will take place on the 9th day of April, 1900.

THE COURSE FOR THE DEGREE OF GRADUATE IN PHARMACY

Occupies two annual school sessions of fully six months each, from September to April, as stated, thus including the Fall Term and Winter Term of each of the two years. The amount of instruction received by each student taking this course is about 700 hours annually, or over 1400 hours in the two years together. Of that total number of instruction hours, about 960 hours are given to the laboratory courses, and about 450 hours to lectures, recitations, etc.

THE COURSE FOR THE DEGREE OF PHARMACEUTICAL CHEMIST

Occupies two school years of about nine months each, including the whole three terms of each year. The curriculum for this degree includes all of the courses required for the degree of Graduate in Pharmacy together with additional work, fully occupying the student's time during the Spring Terms of both years.

This course embraces over 2,200 instruction hours in the two years together, or over 1,100 hours each year. More than 1,600 hours are given to the laboratory courses.

THE COLLEGE BUILDING.

The home of this school is an imposing edifice of six stories, containing liberal provision for lecture-rooms, laboratories, library and museum, recitation-rooms, professors' rooms, offices, cloakrooms, and other requisites of a well-appointed modern college building.

The laboratories and other rooms of the School of Pharmacy are supplied with the conveniences afforded by steam, electricity, and gas, and are well lighted and ventilated.

The lecture-room is ample, airy, exceptionally well furnished, equipped with every convenience for lecture demonstrations, and connected with well-supplied preparation and apparatus rooms, and the Chemical Museum.

A large recitation-room and an amphitheater seating over four hundred are also at the disposal of the school.

Women being admitted to the classes, the school has separate study and dressing-rooms for their exclusive use.

THE LABORATORIES.

There are seven principal laboratories, with a total floor space of about 16,500 square feet, and in which classes of about four hundred students annually can be accommodated, each student taking all of the required laboratory courses. These laboratories are: (1) The General Chemical Laboratory, in which courses are given in preparatory experimental chemistry, qualitative chemical analysis, inorganic volumetric analysis, and inorganic gravimetric analysis; (2) the General Pharmaceutical Laboratory for courses in pharmaceutical processes and the production of inorganic and organic pharmaceutical preparations and chemicals; (3) the Laboratory for Pharmaceutical Botany, Pharmacognosy, and the Microscopical work; (4) The Laboratory for Applied Pharmaceutical Chemistry, in which courses are given in drug assaying, the valuation of organic pharmaceutical preparations, food and sanitary analysis, and other organic analytical work; (5) the dispensing laboratory for instruction and practice in the art of compounding and dispensing medicines and for related courses; (6) the Bacteriological Laboratory, in which training is given in the technique of preparing culture media, methods of culture, etc.; and (7) the Laboratory for Physiological Chemistry, in which urine analysis is taught.

THE MUSEUMS AND LIBRARY.

The Museum of Pharmacognosy contains several thousand specimens of plant-drugs and related products. The Chemical Museum contains extensive and valuable collections of not only the common chemicals employed in medicine and pharmacy, but also of other interesting and instructive products of chemical technology. Specimens of the pharmaceutical preparations, organic as well as inorganic, are also provided for inspection by the students.

Special exhibits of the most important drugs and preparations, apparatus, and other objects of the greatest interest to the pharmaceutical student are contained in the various instruction-rooms and laboratories.

The Library of the school contains just such works as are, above any others, useful to the scientific and practical pharmacist, and also the most important periodical publications, foreign as well as American.

THE SCOPE AND METHODS OF INSTRUCTION.

The courses of instruction are graded or progressive and as comprehensive as is consistent with thoroughness.

The subjects taught are Pharmacy, Physics, Chemistry, Botany, Microscopy, Pharmacognosy, Human Anatomy and Physiology, Materia Medica, Therapeutics and Toxicology, Applied Pharmaceutical Chemistry, Qualitative and Quantitative Analysis, and Bacteriology. The several courses in these departments are outlined on pages 11 to 23.

This school has a separate Faculty for its own special work, and the teachers devote their entire time and attention to their school work. Thus the courses of instruction provided for the students are specially adapted to the practical wants of pharmaceutical workers, and the relative amount of time devoted to each subject is in just proportion to its character and importance.

The methods of instruction include lectures, recitations, reviews, and laboratory practice.

The *lectures* are illustrated by experiments, charts, apparatus, specimens, etc., as occasion requires.

Each student is assured as large a share as practicable of the individual attention of the teachers, and it is sought to make his work interesting as well as instructive, to cultivate his desire for knowledge, and to teach correct methods for its acquisition.

All students are held to their appointed hours of school-work and to the necessary text-book study.

Class exercises are conducted for the purpose of affording adequate practice in the solution of pharmaceutical problems, the use of technical nomenclature, the study of prescriptions, and the recognition of drugs and preparations.

Laboratory work, which, in this school, occupies about three-fourths of the instruction hours, is a highly important feature of the courses, and at the same time constitutes the most profitable recreation the student can have.

REQUIREMENTS FOR THE DEGREE OF GRADUATE IN PHARMACY.

For Admission—Students entering to take the course for the degree of Graduate in Pharmacy must be not less than eighteen years of age, and must have a preliminary general education at least equivalent to that required for admission to a public high school.

Certificates, diplomas and other written evidence of sufficient preliminary education may be forwarded to the school, in order that students may know in advance whether or not they will be admitted without examination. Students not presenting satisfactory evidence of sufficient preliminary education will be required to pass an entrance examination in English and arithmetic. The examination will cover: Ability to write English, correct in orthography, punctuation, the use of capitals, grammatical construction and composition; and, in arithmetic, the knowledge and use of common and decimal fractions, and percentage and proportion.

Students enrolled as apprentices or as assistant pharmacists or registered pharmacists by the State Boards of Pharmacy, will be admitted without examination. Also persons holding licenses or certificates as teachers.

Students having completed the "Junior Course" in any other college or school of pharmacy, are admitted to the Senior Class, if deemed prepared to enter upon the studies of the "Senior Course" in this school.

Those intending to take a college course in pharmacy are advised to use a portion of their time in suitable preliminary reading at home or in the store, if practicable. Advice as to what to read will be given, if desired.

For Graduation—The requirements for the degree of Graduate in Pharmacy include regular attendance during two annual school sessions of six months each—the "Junior Course" and the "Senior Course"—satisfactory completion of the required work, including good standing in the recitations and examinations throughout the courses, and diligence and success in the laboratory work.

REQUIREMENTS FOR THE DEGREE OF PHARMACEUTICAL CHEMIST.

For Admission—Students having diplomas or certificates of graduation from standard high schools, or from other schools of equal or higher grade, or certificates of good standing in institutions of the collegiate grade, and students presenting evidence of other sufficient educational preparation, satisfactory to the faculty of the school, are admitted without examination to the course for the degree of Pharmaceutical Chemist.

For Graduation—The degree of Pharmaceutical Chemist is conferred upon students who have completed the prescribed courses and shown good scholarship in the recitations, examinations and laboratory work. The required work occupies two college years of nine months each.

GENERAL REQUIREMENTS.

The conditions prerequisite to promotion and graduation include: Satisfactory deportment, due observance of the rules of the school, regular attendance during the full period prescribed, satisfactory completion of the required work, including good standing in the recitations and examinations throughout the courses, diligence and success in the laboratory work, payment in full of all dues, and the settlement of all laboratory accounts.

COURSES OF STUDY AND LABORATORY PRACTICE.

FIRST YEAR.

FALL TERM.

1. *Introductory.*—Definition and scope of pharmacy. Its functions and problems. The work that lies before the student at the School of Pharmacy, and how it is best accomplished.

Prof. Oldberg.

2. *Physics.*—A short course in elementary physics is given to all students who have not had sufficient preparation in this branch of science before entering college. The topics considered will be selected mainly from the departments of mechanics, heat, light and electricity, and, as far as possible, will be abundantly illustrated by experimental demonstrations. Prof. Long.

[The principles of physics directly bearing upon certain subjects discussed in the special courses in the departments of pharmacy, chemistry, botany and microscopy will be sufficiently treated of in explanation of their application to those subjects.]

3. *Metrology and Pharmaceutical Arithmetic.*—Matter and energy. Gravitation. Mass, volume and density, and their relations. Principles of metrology. The metric system. The weights and measures of America and of Great Britain. Balances and weights, and their use. Volume measures. Specific weight and specific volume. Instruments for the determination of specific weights.

Class drills are conducted in the working out of pharmaceutical problems connected with the relations of weight and volume, the use of volumetric and gravimetric methods, proportions, percentage, doses, problems in dilution, fortification and other adjustments.

PROF. OLDBERG.

4. *Microscopy.*—Study of the optical properties of mirrors and lenses, and the mechanism and manipulation of the compound microscope. Comparison of the more important microscopes now in use. The properties and uses of micro-reagents. The cutting of sections and preparation of microscope mounts.

This course is a necessary preparation for courses 13 and 15.

PROF. SCHNEIDER.

5. *Elementary Materia Pharmaceutica.*—Preliminary discussion of the substances employed in the production of medicinal and pharmaceutical preparations. Their nature and composition, the reasons why they must be subjected to pharmaceutical methods of preparation before they can be efficiently and conveniently employed for medicinal uses, and the problems presented in that direction.

PROF. OLDBERG.

6. *General Inorganic Chemistry.*—Course of lectures on the principles underlying chemistry as a science, designed to give the student a clear insight into chemical theories.

The Department of Chemistry is well supplied with the best forms of apparatus required in illustrating and explaining fundamental chemical phenomena and for demonstrating leading technical chemical processes. Many important matters are illustrated by lantern views projected on a screen by means of an excellent electric lantern and a collection of about three hundred slides.

PROF. LONG.

7. *Chemistry of the Non-Metallic Elements.*—Following course 6, lectures are given covering the field of the inorganic chemistry of the non-metallic elements.

The lectures of courses 6 and 8 are followed each week by a recitation or quiz, in which the class, divided into sections, is thoroughly drilled in the solution of chemical problems and other matters presented in said lectures. PROF. LONG.

8. *General Pharmaceutical Botany.*—A course of lectures on the domains of botany referring especially to the cell and cell theories; general morphology and physiology of cells, tissues and organs; the absorption, assimilation and storing of food-substances; occurrence and formation of cell contents; ascent of cell-sap; photo-syntax; symbiosis; movements of plants; pollination and fertilization of plants; origin of domestic plants; influence of cultivation, etc.

PROF. SCHNEIDER.

9. *Elementary Experimental Chemistry.*—Beginners in the laboratory take up first a course of experiments similar to many shown in the lecture-room, but simpler in detail, and chosen to give the student practical familiarity with elementary facts and principles. The preparation of a large number of simple substances, with a study of their characteristic properties and tests, is included in this course, which serves as a good introduction to Qualitative Analysis.

PROF. DAINS.

10. *General Pharmaceutical Operations.*—Heat, and its applications and effects in relation to pharmaceutical processes and preparations. Heating apparatus and appliances.

Comminution, coarse and fine. Powders. Machinery and apparatus for cutting, crushing, pulverization, sifting, etc.

Mixing of solids; mixing of liquids; mixing of solids and liquids. Solution. Simple and chemical solution. Solvents. Physical precipitation. Capillary force, osmosis, dialysis, diffusion. Methods of extraction. Pharmaceutical menstrua. Maceration, digestion, coction; percolation in its various forms. Separation of solids and liquids. Expression, colation, filtration. Other methods of clarification. Separation of immiscible liquids. Decolorization. Evaporation and distillation. Sublimation. Crystallization and precipitation.

Throughout this course the application of the principles of physics will be pointed out as far as deemed necessary.

PROF. OLDBERG.

11. *Preparatory Laboratory Course in Pharmaceutical Operations.*—Practice in the use of apparatus in the application of simple pharmaceutical processes of preparation and purification of pharmaceutical products, not involving chemical reactions. Products prepared by fusion, sublimation, solution, extraction, filtration, turbidation, precipitation, evaporation, distillation, crystallization, etc.

Laboratory studies upon the pharmaceutical properties of common plant substances such as cellulose, starch, gums and mucilages, pectin, sugars; albumin; fixed oils; fats and waxes; volatile oils, resins, oleo-resins and gum-resins; tannin; extractive, etc.

This course illustrates and supplements courses 5 and 10.

PROF. MINER.

12. *Qualitative Chemical Analysis (A).*—Identification and separation of *known substances.*

In this first and elementary course the student is made acquainted with the fundamental principles of qualitative analysis, and is given a large amount of practice in the application of simple tests to substances of known composition. Following this comes the application of the knowledge acquired to the separation of mixtures of known composition into groups and the final detection and identification of the elements and acid-radicals known to be present.

PROF. DAINS.

13. *The Histology of the Cryptogams.*—Laboratory course in the study of the histology of types of cryptogamous plants, as algæ, fungi, lichens, liverworts, mosses, and ferns. Special attention is given to the evolution and biological relationship of the plant groups referred to as revealed by their structure. The evolution and modification of cells, cell-contents, tissues and organs, alternation of generations and spore-formation will also be considered.

This course supplements course 8. PROF. SCHNEIDER.

WINTER TERM.

14. *Chemistry of the Metals.*—This lecture course, together with courses 6 and 7, will fully cover the field of inorganic chemistry, with as much general and theoretical chemistry as is necessary to the pharmaceutical student. Weekly recitations or quizzes and class work supplement this course of lectures, as well as course 7.

PROF. LONG.

15. *The Histology of the Phanerogams.*—This laboratory course is a continuation of course 13, and consists of the study of the histology of coniferous, monocotyledonous and dicotyledonous plants. Special attention will now be given to cell-modification and cell-contents, so as to prepare the student for the intelligent study of the histology of vegetable drugs. Suitable micro-chemical reagents will be employed to aid in differentiating tissues, cells and cell-contents.

PROF. SCHNEIDER.

16. *Qualitative Chemical Analysis (B).*—Identification and sep-

aration of *unknowns*. This laboratory course is a continuation of course 12. In this more advanced course the work is concerned with the analysis of substances and mixtures the composition of which is not known to the student. Prof. Dains.

17. *Vegetable Organography and Taxonomy.*—A course of lectures on the gross structure of plant organs, special attention being given to leaf-modification, phyllotaxy, inflorescence, flowers, fruits, and seeds. The principles of classification and nomenclature will be explained. This course is intended to prepare the student for an intelligent study of the gross structure of vegetable drugs and the identification and classification of the more common plant forms. Prof. Schneider.

18. *General Review of the Galenical Pharmaceutical Preparations.*—Classification; inorganic and organic; dry and liquid; officinal and extemporaneous preparations. Species, powders, confections, troches, masses, pills. Cataplasms, ointments, cerates, plasters, suppositories. Liquid mixtures; emulsions. Solutions, waters, mucilages, syrups, honeys, glycerites, spirits. Infusions, decoctions, tinctures, fluid extracts, wines, vinegars. Solid extracts, oleoresins, resins. Miscellaneous preparations. Prof. Oldberg.

19. *The Pharmacopoeia of the United States.*—The character, scope and functions of pharmacopœias. Essential parts and features of the American pharmacopœia. Its drugs, chemicals, and preparations. Its working formulas, standards, and other contents. Prof. Oldberg.

20. *Pharmaceutical Nomenclature.*—The principles of construction of systematic nomenclature and its relations to systematic classification. Bearing of both upon scientific pharmacy. Latinic and non-Latinic systematic titles. Non-systematic names. The Latinity of the nomenclature of the pharmacopœias. Class drills in the correct reading, writing, pronunciation and use of technical titles. Prof. Oldberg.

21. *Laboratory Practice in the Production of Galenical Preparations.*—Studies in percolation and other methods of extraction, and practice in making preparations selected with the view to exemplify instructive and important pharmaceutical processes.

This course illustrates and supplements course 18. Prof. Miner.

22. *Volumetric Inorganic Analysis.*—This laboratory course follows course 16. The principles common to all volumetric methods

of analysis are developed and illustrated by simple exercises in alkalimery and acidimetry, oxidation and reduction, and precipitation. The nature and uses of the several indicators are explained and the cases in which they are applicable or inapplicable are defined and demonstrated. The student is then ready for practical work involving the use of standard acid and alkali solutions and solutions of silver nitrate, sodium thiosulphate, iodine, ammonium thiocyanate, potassium permanganate and other reagents employed in the valuation of many technically important inorganic substances.

PROF. DAINS.

SPRING TERM.

[Courses 23 to 28, inclusive, are obligatory upon all students who are candidates for the degree of Pharmaceutical Chemist. Any or all of these are offered as elective courses to any student.]

23. *Chemical Physics.*—A course of about twenty lectures, with demonstrations and with practice by the class so far as possible. This course, given only to students who are candidates for the degree of Pharmaceutical Chemist, is practical rather than theoretical. It deals with the application of physical methods to the solution of chemical problems, and with the construction and use of optical and electrical apparatus employed by chemists and physicians.

PROF. LONG.

24. *Inorganic Gravimetric Analysis.*—This laboratory course begins with the simple fundamental operations characteristic of the general method and proceeds to the special processes involved in the actual gravimetric determination of inorganic substances. Practice is given in the determination of the more important bases and acids and in the separation of a sufficient number of substances to make the student familiar with the essential features of this branch of quantitative chemistry. PROF. DAINS.

25. *Unofficial Pharmaceutical Preparations* of various kinds, including elixirs, syrups, wines, and other compounds. The "National Formulary." Proprietary preparations and their congeners.

PROF. OLDBERG.

26. *Methods of Extraction and Purification of Plant Substances.*—Isolation of chemical constituents of plant drugs by the more simple methods, as by means of solvents, etc. Production of volatile oils, fixed oils, resins, oleoresins, tannin, glucosides, alkaloids, etc.

PROF. OLDBERG.

27. *Laboratory Practice* in the preparation of finished products, such as are referred to in courses 25 and 26. PROF. MINER.

28. *Bacteriology.*—Lectures and laboratory work arranged as follows: The morphology and physiology of bacteria and related organisms; the economic value of bacteria; bacteria in health and disease, including the consideration of natural and acquired immunity; the preparation of culture media from the standpoint of the pharmacist; culture methods and the methods of straining; the culture, examination and identification of some of the more common germs of the earth, air, and water; the nature and preparation of toxins and antitoxins. PROF. SCHNEIDER.

29. *Field Botany, the Identification of Plants, and the Preparation of Herbaria.*—In this course the student is required to identify plants of the local flora, and will be instructed how to collect, dry and mount them for the herbarium. Several excursions will be made for the purpose of studying plant types in the field and to collect materials for study and for mounting. PROF. SCHNEIDER.

SECOND YEAR.

FALL TERM.

30. *The Pharmacy of Inorganic Chemistry.*—General principles governing inorganic pharmaceutical chemical processes and the selection of materials and methods. The pharmacopœial inorganic chemical preparations and their pharmacy, with class exercises in problems bearing upon these subjects. PROF. OLDBERG.

31. *Laboratory Practice in the Production of Inorganic Pharmaceutical Preparations.*—This course is in illustration of and supplemental to course 30. It is taken either in the Fall Term or in the Winter Term. PROF. MINER.

32. *General Organic Chemistry (A).*—A course of lectures on Organic Chemistry, abundantly illustrated by experiments showing the methods employed in the preparation of many important organic compounds, mainly of pharmaceutical interest. The methods of ultimate organic analysis, the determination of vapor-density by the Dumas, Gay-Lussac, V. Meyer, and Hofmann processes, and the use and practical applications of the polariscope and other kinds of apparatus for special work, are shown by suitable experiments. In this course special attention is given to the explanation of the important methods and principles of organic synthesis as the groundwork of all accurate knowledge on the subject.

Following the study of the general principles of organic chemistry, the special chemistry of the paraffins and their derivatives, including the important alcohols, aldehydes, acids, ethers, simple nitrogen derivatives, and fatty bodies, will be taken up.

Prof. Long.

33. *Pharmacography (A).*—This course consists of the macroscopical and microscopical study of the more important official and unofficial vegetable and animal drugs. Attention will also be given to the history of drugs and the time and modes of collecting, manner of curing and preserving them. Causes which lead to the deterioration of drugs. Drug parasites. The habitat and range of drug-yielding plants and their botanical characters, together with the characteristics of the orders to which they belong. The influence of cultivation on the properties of drugs. The common drug adulterants.

The drugs studied in course 33 are roots, rhizomes, tubers, bulbs, twigs, woods, and barks. The drugs of animal origin are also studied in this course. Prof. Schneider.

34. *Human Anatomy and Physiology.*—Lectures and recitations intended to sufficiently acquaint the student with the morphology and physiology of the human body to enable him to understand the processes of digestion, assimilation, circulation, respiration, and nerve action, and the physiological action of drugs.

Prof. Schneider.

35. *The Pharmacy of the Organic Chemical Preparations and the Digestive Ferments.*—The hydrocarbons and their derivatives, alcohols, ethers, aldehydes, ketones, chloroform, iodoform, chloral, organic acids, and the newer remedies of organic chemistry, such as antipyrine, acetanilid, salol, sulfonal, phenacetin, etc., pepsin, pancreatin, diastase, etc. Prof. Oldberg.

36. *Laboratory Course in Dispensing.*—Practical work in the preparation of compound powders, pills, troches, tablet triturates, capsules, ointments, plasters, suppositories, emulsions, and other ex-tempore preparations. Typical and special examples, illustrating the varied phases of the work at the dispensing table.

Mr. Patterson.

37. *Assaying and Valuation of Drugs and Their Preparations.*—General principles and methods. Study of reagents and indicators. Methods of extraction of plant constituents, and their identification. Separation of alkaloids and other substances from each other. The behavior of alkaloids toward immiscible solvents. Practical application of important special methods, including the official processes.

Pepsin, Pancreatin, and Diastase.—Valuation by various methods.

This course occupies one term of about three months. It is given to one-half of the Senior class in the Fall Term, and to the other half of that class in the Winter Term. Prof. Davoll.

38. *Oils, Fats, Waxes, and Soaps.*—Study and laboratory practice in the examination of these products by the most approved methods, including the determination of constants and the application of means of identification and qualitative and quantitative tests. Prof. Davoll.

39. *Lecture Course in Applied Pharmaceutical Chemistry.*—About twenty-four lectures bearing upon the laboratory work embraced in courses 37 and 38, setting forth the principles involved and the necessary conditions of success, and explaining the problems to be worked out in the laboratory. Prof. Davoll.

40. *Electricity.*—About twenty lectures, illustrating important phenomena in voltaic electricity and electro-chemistry, are given in the Fall Term and Winter Term. This course is optional. Prof. Long.

WINTER TERM.

41. *Pharmacography (B).*—This course is in continuation of course 33, and is conducted on the same plan. The drugs studied are the leaves, herbs, flowers, fruits, seeds, and all other plant drugs not included in course 33. Prof. Schneider.

42. *General Organic Chemistry (B).*—This lecture course is in continuation of course 32. It comprises the study of the important unsaturated hydrocarbons and their derivatives, the more complex nitrogen compounds, the carbohydrates and related products, and the important members of the aromatic series.

A large collection of organic products is available for illustration in both courses (32 and 42), and the lectures are, in both courses, followed each week by quizzes on the work of the preceding week. Prof. Long.

43. *Materia Medica and Therapeutics.*—A course of lectures and recitations on the history of medicine and pharmacy, the nature and cause of disease, the properties, action, and uses of drugs and their preparations and doses. Poisons and their toxic effects and antidotes. Prof. Schneider.

44. *Physiological Chemistry.*—A course of twenty lectures is given on topics of practical interest in the field of elementary physiological chemistry. Especial attention is devoted to the subject of foods and the processes and products of digestion. The tests and

characteristic reactions of many important compounds are explained and illustrated. This course is required of all students who are candidates for the degree of Pharmaceutical Chemist.

PROF. LONG.

45. *The Chemical Constituents and Pharmaceutical Preparations of Plant Drugs and Animal Drugs.*—Study of individual preparations of importance, and the methods by which they are prepared. The relations of their chemistry to their pharmacy and their pharmaco-dynamics. Active principles, such as alkaloids, glucosides, resins, and volatile oils, will be studied in connection with the drugs in which they are found. PROF. OLDBERG.

46. *The Art of Dispensing.*—Principles, methods, implements, and materials. Prescriptions and their construction and interpretation. The prescription table. Duties and responsibilities of the dispenser. Incompatibilities and other problems.

PROF. OLDBERG.

47. *The Proper Examination and Preservation of Medicinal Substances.*—Causes of alteration, deterioration, and destruction. Duties of the Pharmacist in this particular. PROF. OLDBERG.

48. *Laboratory Course in the Study of Incompatibilities,* and how to overcome difficulties in that direction. (Laboratory.)

MR. PATTERSON.

49. *Practical Class Drills in the Identification of Pharmaceutical Preparations* by their physical properties and by other similar means, so far as such means of identification are practicable and useful in the direction of avoiding and detecting mistakes.

MR. PATTERSON.

SPRING TERM.

50. *The Organic Pharmaceutical Chemicals.*—Continuation of courses 35 and 45. Methods of production of compounds selected with reference to their importance, the practicability of their profitable preparation by the Pharmacist, and with the view to illustrate general principles and processes. PROF. OLDBERG.

51. *Laboratory Course* supplementing course 50. The preparation of ethers, chloroform, iodoform, alkaloidal salts, acetanilid, salol, aristol, bismuth sub-gallate, and various other organic pharmaceutical chemicals. PROF. MINER.

52. *The Pharmacopoeias of the World.*—Comparative study of their materia medica, chemistry, pharmacy, nomenclature, and other important features, respectively. PROF. OLDBERG.

53.--*Pharmaceutical Education and Pharmacy Laws* in Europe and America. Requirements for registration and license. Duties and responsibilities of pharmacists. Relations of the Pharmacist to public sanitation.

The Pharmacopœial Committee, the State Boards of Pharmacy, Pharmaceutical Associations, and other agencies for the promotion of pharmaceutical progress. PROF. OLDBERG.

54. *Micro-technique.*—Methods employed in preparing permanent microscope slides, including the various processes of fixing, dehydrating, infiltrating, imbedding, cutting sections, staining, clearing, and mounting. Both simple and automatic microtomes are employed in section cutting. PROF. SCHNEIDER.

55. *Examination of Powders.*—Microscopical and macroscopical studies of powdered drugs and spices, with special reference to the detection of adulterants, and the use of test-solutions as means of identification. Comparisons of pure and adulterated products.

PROF. SCHNEIDER.

56. *Chemistry of the Organic Synthetic Compounds.*—A special course of about twenty lectures on the subject of the modern remedies of organic chemistry, treating of their formation, properties, identification, and structural relations, and their positions in the general scheme of chemical classification. PROF. DAINS.

57. *Urine Analysis.*—A laboratory course in the detection of the important normal and pathological products found in urine, and the volumetric determination of those which can be accurately measured, and which are important for diagnosis. PROF. LONG.

58. *Determination of Alkaloids, Glucosides, etc.*—More advanced and varied work in continuation of course 37. Study and comparison of the most recent approved methods. PROF. DAVOLL.

59. *Food and Sanitary Analysis.*—In this, as in courses 37, 38, and 58, it is especially desired to place in the hands of the student the tools by which he is destined to work out his own future methods. The substances selected for intimate study and analysis are such as involve not only general processes, but also special and exceptionally difficult manipulations, and they are at the same time such articles as are commonly met with in commerce. This course will include determination of the following plant constituents: Sugars, starch, oil, resin, cellulose, and tannins by different methods. The Kjeldahl method for the determination of nitrogen; the determination of alcohol under varied conditions, etc.

Baking Powders.—The examination of baking powders, including the determination of tartrate, phosphate, alum, ammonia, available carbon dioxide, and "filling."

Milk analysis for fat, sugar, curd, and water.

Cheese.—Examination for water, fat, casein, acid, and ash.

Butter, Oleomargarine, etc., will be examined for moisture, salt, curd, fat, coloring matter.

Sanitary Water Analysis.—Examination of color, odor, taste, total solids, chlorides, phosphates, hardness, poisonous metals, nitrogen as ammonium compounds, albuminoid matter, nitrates and nitrites.

Students taking Applied Pharmaceutical Chemistry will have practice in the use of the thermostat, vacuum desiccator, vacuum pump, in vacuum distillation, fractional distillation, etc.

PROF. DAVOLL.

N. B.—During the year 1899-1900 the Senior Class taking the course for the degree of Graduate in Pharmacy having completed the Junior Course under the plan followed heretofore, will have the same Senior work as in past years. That work is included in courses 22, 30, 31, 32, 33, 34, 35, 36, 41, 42, 43, 45, 46, 47, 48, 49, and 57.

Graduates in Pharmacy who take the second year's work for the degree of Pharmaceutical Chemist during the year 1899-1900, will have courses 35, 37, 38, 39, 44, 45, 47, 50, 52, 53, 54, 55, 56, 58, and 59.

The Junior Courses will, during 1899-1900, be in accordance with the descriptions given in the preceding pages, and after that year all of the courses will conform to the plans here described.

SUMMARY OF THE LABORATORY COURSES.

Preparatory Courses, Pharmaceutical Laboratory (11)	72 hours
Preparatory Course in the Chemical Laboratory (courses 9 and 12)	144 hours
Vegetable Histology (courses 13 and 15)	72 hours
Qualitative and Inorganic Volumetric Analysis (courses 16 and 22)	144 hours
Pharmaceutical Laboratory Course in Production of Galenical Preparations (course 21)	72 hours
Inorganic Gravimetric Analysis*	160 hours
Pharmaceutical Laboratory Practice in the preparation of finished products, described in courses 25 and 26*	60 hours
Bacteriology*	100 hours
Production of Inorganic Pharmaceutical Chemicals in the Pharmaceutical Laboratory	168 hours
Pharmacography (courses 33 and 41)	72 hours

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* Courses marked by a (*) are not obligatory upon students taking the course for the degree of Graduate in Pharmacy, but are required for the degree of Pharmaceutical Chemist.

Courses 36 and 48 in the Dispensing Laboratory	48 hours
Applied Pharmaceutical Chemistry (courses 37 and 38)	168 hours
Pharmaceutical Laboratory Course 51*	80 hours
Microscopical Laboratory Courses 54 and 55*	30 hours
Urine Analysis*	80 hours
Applied Pharmaceutical Chemistry and Food and Sanitary Analysis (courses 58 and 59)*	160 hours
Total	1,630 hours

ADMISSION TO ADVANCED STANDING.

Any student presenting proper evidence of having satisfactorily completed in any other good school any one or more of the courses of study included in the curriculum of this school may, if desired, receive such credit therefor as may be consistent with the standard of requirements.

TEXT BOOKS AND BOOKS OF REFERENCE.

Certain books are necessarily adopted as the principal text-books, in order that students may be able to keep up with their studies without difficulty. They are selected by the Faculty as being the best for the students, and in harmony with the courses of instruction. Students will therefore find it to their advantage to use these books in preference to others.

Pharmacy—The United States Pharmacopœia, Seventh Revision; Oldberg's General Principles of Pharmacy; Weights and Measures; Pharmaceutical Problems; 1,500 Prescriptions; Laboratory Manual of the Inorganic Pharmaceutical Preparations.

Chemistry—Long's Inorganic Experimental Chemistry; Long's Analytical Chemistry; Long's Physiological Chemistry and Urine Analysis; Remsen's Organic Chemistry.

Botany and Pharmacognosy—Schneider's Microscopy and Microtechnique, Hints on Drawing, Vegetable Histology; Pharmacography, Maisch or Schneider; Vegetable Organography, by Rusby; Physiology, by Ashby; Materia Medica and Therapeutics, White and Wilcox; Powdered Drugs, by Schneider; Gray's Manual of Botany.

Bacteriology—Bacteriological Technology, Salomonson.

Applied Pharmaceutical Chemistry.—Lyons' Assay of Drugs; Allen's Commercial Organic Analysis.

Some of these books are used only by the Junior Class; others only by the Senior Class, and others by both classes.

The necessary text-books can be obtained at the school.

Works of Reference—Companion to the United States Pharmacopœia; National Dispensatory; United States Dispensatory; Remington's Practice of Pharmacy; Oldberg's Outline of a Course in Pharmacy; Prescott's Organic Analysis; Flückiger & Hanbury's Pharmacographia; Roscoe & Schorlemmer's Chemistry; Benedict and Lewkowitsch on Oils, Fats and Waxes; Dragendorff's Plant Analysis; Squibb's Ephemeris; Wormley's Micro-Chemistry of Poisons; Guareschi on Alkaloids.

PRIZES.

Valuable sets of pharmaceutical apparatus, including forty pieces, together with large assortments of pure ground and powdered drugs, in pound and half-pound packages, are offered by Messrs. Gilpin, Langdon & Co., of Baltimore, as prizes for the best work performed in the pharmaceutical laboratories. This prize is awarded to one member of each graduating class.

EXPENSES AND DEPOSITS.

The *matriculation fee,* payable only once, and before registration for the Junior Course, is $5.

The *diploma fee,* payable not later than two weeks prior to graduation, is $10.

The *tuition fee* for the Fall Term is $40; for the Winter Term, the same sum; and for the Spring Term, $30. These fees are subject to discount when all dues are paid for two consecutive terms in advance, as stated below.

The charge for *materials* (drugs, chemicals, etc.,) consumed by the student in his laboratory work is $5 per term.

But any student who wantonly or carelessly wastes the materials supplied to him will be liable to a proportionate additional charge for additional supplies furnished to replace those lost by him.

To cover the cost of apparatus lost, destroyed, or damaged, and any damage willfully or heedlessly inflicted to building, furniture, or other property, each student is required to make a *deposit* of $5 before being assigned tables in the laboratory. This laboratory deposit is intended to cover the whole school year, and is in most cases sufficient for that purpose. But students who may damage or destroy apparatus or other college property to the value of more than the amount of their deposits, will be required to make good the damage in addition. Deductions will be made from the deposit to cover the cost of avoidable loss or breakage, and articles not returned. Each student will be charged for damage or loss for which he is individually responsible and for his *pro rata* share of damage or loss the responsibility for which cannot be individually located. The remainder of his deposit is returned to each student at the end of the year, or whenever he discontinues his attendance at the school.

Certain indispensable articles (*not materials consumed*) are necessarily furnished by the school for the convenience of the students, and to render the work effective and orderly. These articles include, for example, note books, drawing books, dissecting needles for use in the microscopical laboratory, aprons and sleeves, additional pieces of apparatus required to replace those broken or lost, etc. These articles are furnished as nearly as practicable at cost. For this purpose each student is required to obtain a coupon ticket to the amount of $5. Supplies of this kind are issued in no other way. Unused coupons are redeemed at the end of the year, or whenever the student discontinues his attendance.

Tickets sold to any courses of instruction are not transferable, and cannot be exchanged or returned.

A discount of $5 is made when the fees for two consecutive terms are paid at one time in advance. Thus the members of the Junior Class may, at the time of entering, pay $100 in full for matriculation, materials, laboratory deposit, coupon ticket, and tuition for the two terms, beginning with the last week in September, and ending with the first week in April, instead of $60 for matriculation, materials, laboratory deposit, coupon ticket, and tuition at the beginning of the Fall Term, and $45 for tuition and materials at the beginning of the Winter Term. Senior students may pay $95 at the beginning of the Fall Term for tuition, materials, laboratory deposit and coupon ticket for the two terms mentioned; or $55 for tuition, materials, laboratory deposit and coupon ticket for the Fall Term, and $45 for tuition and materials for the Winter Term.

The fees and deposits required to be paid for the Spring Term, covering tuition, materials and laboratory deposit, aggregate $40.

Text-books, note-books, laboratory aprons, towels, filter-paper, and any other articles not included in the outfits of apparatus, or not returnable, are furnished to the students at cost. But any student may purchase these books and articles wherever he sees fit.

Board and Room—Very good board and room together can be secured near the school at from $4 to $6 per week. Students may also secure rooms and board separately. Information in regard to these matters and addresses of reliable and satisfactory private boarding places and furnished rooms will be supplied at the college office. Good accommodations are plentiful, and satisfactory arrangements can be quickly made by each student immediately upon his arrival. It is wholly unnecessary and rarely advantageous to secure board and room in advance.

EARLY ENROLLMENT.

All students intending to enter the college will find it a great advantage to write early for information and matriculate in good season.

There is always more or less rivalry among the students of all professional technical schools in the selection of lecture-room seats and laboratory tables. In this school, where the classes are very large, and where each student is assigned an individual desk in each of several laboratories throughout his college attendance, it has been found necessary to adopt the rule that all students shall be entitled to their turn in the order in which they are enrolled, according to the payment of the matriculation fee or its equivalent. No student is allowed to select his lecture-room seat or laboratory desks until the whole class comes together at the beginning of the school session. The names of all of them are then called in the order in which they have secured their enrollment by the payment of $5 (which is credited to them as a matriculation fee if new students, or on account of their laboratory deposit if already matriculates of this school), and each student is privileged to make his own choice. Matriculation fees and all other dues are to be sent or paid to Mr. H. P. Hendricks, 2429 Dearborn street, Chicago.

EMPLOYMENT IN DRUG-STORES.

Students who desire to obtain employment in drug-stores to enable them to earn their expenses during their college attendance, should send for the special circular relating to such employment.

The Annual School Session of 1889-1900 begins on the 25th day of September, 1899.

Those desiring further information in regard to the School of Pharmacy should address Professor Oscar Oldberg, the Dean of the School, 2421 Dearborn Street, Chicago, Illinois.

MATRICULATES--1898-99.

COURSE FOR THE DEGREE OF PHARMACEUTICAL CHEMIST

Bangert, Louis Edward	Peru.
Eaton, Roy Tuttle	Watsonville, Cal.
Koch, Adolph Charles	Maryville, Mo.
McLean, Claire French	Urbana.
Merrill, Will Garrison	Sparta, Wis.
Raquet, Emil Hartman	Aurora.
Schiek, Jacob Gabriel	Chicago.

COURSE FOR THE DEGREE OF GRADUATE IN PHARMACY

SENIORS.

Allen, Harry Wilber	Lima, O.
Bacon, George Jerome	Somonauk.
Baker, Louis Guy	Covington, Ind.
Beck, Fred Oswald	Clinton, Ia.
Blu, Harry	Milford.
Bollenbach, George William	Galesburg.
Bond, Harry England	Mt. Vernon.
Bourns, William Livingstone	San Jose, Cal.
Brashears, John Willis	Chicago.
Brennan, Frank	Alliance, Neb.
Broman, August John	Cambridge, Neb.
Burger, Albert	Chicago.
Burnell, Mrs. Eliza Woolley	Streator.
Busse, William Frederick	Alton.
Clouse, Grace	Hope, Ind.
Cohn, Bert William	Peru, Ind.
Colaw, Orrie Omer	Rest, Kan.
Cortright, Charles Nathan	Dixon.
Dalziel, William Anton	Waukonda, S. D.
Danek, Eric Jacob	Chicago.
Daniel, William Andrew	Hogansville, Ga.
Detrick, Hiram E.	York, Neb.
Dewell, Maud	Cushing, Ia.
Dewey, Anson Cyrus	Hemlock, Wis.
Diehl, Herman	Lanark.
Doggett, Lucy Frances	McKinney, Tex.
Dorr, Harry Arthur	Table Grove.
Dudenbostel, Louis Ernst	Campbell Hill.
Dulaney, Joseph Field	McKinney, Tex.
Easley, John Robert	Alexandria, Neb.
Elsner, Fred Hamroad	Chicago.
Fallon, Charles Milton	Hot Springs, S. D.
Fetherston, Samuel Hutchinson	Chicago.
Flanders, Ruth Eunice	Elkhorn, Wis.
Frank, Joseph Samuel	Chicago.
Garlick, Jedediah	Fairview, Utah.
Giffen, Roy R.	Fowler, Cal.
Goff, William Willis	Beaulieu, N. D.
Grace, Paul	Harrisburg.
Green, Claire Milton	Colfax.
Gregg, Thomas Duncan	Harrisburg.
Grenier, Achille Bettridge	Racine, Wis.
Griffith, Edward Luke	Farm Ridge.
Grotjan, Frederick Samuel	Rock Island.
Harwood, Miner Flower	Strawberry Point, Ia.
Hawley, Robert Coleman	Mound City.
Hawley, William Dorrance	Coldwater, Mich.
Heath, Bert Orcutt	Newfield, N. Y.
Hebsacker, Carl L.	Cairo.
Helm, George Herbert	Algonquin.
Hennig, Charles Herman	Oshkosh, Wis.
Hensley, Harry Yates	Clinton.
Hoffman, Robert Perry	Bloomington.
Hofmann, Frank Phillip	Ottumwa, Ia.
Hoke, Volney George	Morris, N. Y.
Hoover, Judson Wilkes	Mt. Pleasant, Ia.
Hutzel, Joseph Charles	Ft. Wayne, Ind.
Jehlik, Anton Josef	Chicago.
Jewell, Bert	Dodgeville, Wis.
Johnson, William	Chicago.
Jones, David Ambrose	Williamsburg, Ia.
Julian, Harry W.	Leland.

Keeler, Walter Centennial........... Freeport.
Kidder, Thomas Chase......Monica.
Klossoski, Frank John........Dixon.
Knick, William John.......Chicago.
Kriebs, Frank Delbert..Elkport, Ia.
Lambrecht, John Richard..Chicago.
Lamm, John Joseph....Decorah, Ia.
Lemke, Charles Herman...Chicago.
LeSaulnier, Albert Frederick......... Red Bud.
Loesing, August Christian........... Sheboygan, Wis.
Lutz, John Erwin..Puyallup, Wash.
Marquette, Will George............... Watertown, Wis.
Martin, Sanford Alonzo..Heyworth.
McComb, Ernest Hubert............ Lebanon, Mo.
McLaughlin, Clell J..Monticello, Ia.
Meehan, Louis Florence.............. Waterloo, Ia.
Merritt, Clyde Alvin..Meadville, Pa.
Meyer, Edouard George....Chicago.
Meyer, Walter Paul..Morton, Minn.
Miller, Carroll Morten................ Laurens, S. C.
Miller, Ralph Dobson................. Greenville, Tenn.
Miller, William Edgar................ New Buffalo, Mich.
Mott, Dana Willis..........Chicago.
Mueller, William Daniel...Chicago.
Muesse, Fred William............... Lancaster, Wis.
Norton, Paul Stewart.......Normal.
Nyman, Charles Victor.....Batavia.
O'Leary, Daniel James.....Chicago.
Pease, Everett J........Lowell, Wis.
Phillips, William Chambers.......... Clarinda, Ia.
Reed, Frederick Glyde.......Quincy.
Reed, Walter Henry.................. Corning, N. Y.
Renaud, Joseph Thomas Ubald..... Perth, Ont., Can.
Roby, George Hewitt.......Chicago.
Roemer, Herman.......Mt. Pulaski.
Schmidt, Hugo........Oshkosh, Wis.
Selby, James Joseph.........Peoria.
Serr, Peter L.........Scotland, S. D.
Shaffer, Sadie........Redfield, Mich.
Soleman, Fred Armstrong............ Tama, Ia.
Stewart, David Everett.............. Greenwood, Wis.
Street, Sidney Beman................ Columbus, Miss.
Talty, Nicholas Peter..Waterloo, Ia.
Vasumpaur, Rudolph Robert........ Chicago.
Wachowski, John George..Chicago.
Walbridge, Ernest Lucien............ Beloit, Wis.
Weaver, Harold Townsend........... Schuyler, Neb.
Wilson, George Baright.............. Los Angeles, Cal.
Woelke, Edward Charles..Chicago.
Wold, Walter Edward................ Austin, Minn.
Wright, George Irving............... Klamath Falls, Ore.
Wright, Walter Woodruff............ Adrian, Mich.
Zillig, John Adam, Jr...Dubuque Ia.
Zinn, Herman.........Oshkosh, Wis.

JUNIORS.

Adams, Arthur Elewood...Chicago.
Allen, Harry Wilber........Lima, O.
Bacon, George Jerome..Somonauk.
Baker, Louis Guy...Covington,Ind.
Beck, Fred Oswald......Clinton, Ia.
Bell, Claudius DeWitt......Chicago.
Blu, Harry...................Milford.
Bollenbach, George William......... Galesburg.
Bond, Harry England..Mt. Vernon.
Bourns, William Livingstone........ San Jose, Cal.
Brashears, John Willis.....Chicago.
Brennan, Frank.......Alliance, Neb.
Broman, August John............... Cambridge, Neb.
Brown, Arthur Asbury.....Chicago.
Burnell, Mrs. Eliza Woolley......... Streator.
Busse, William Frederick.....Alton.
Casteel, Robert.............Marshall.
Clouse, Grace.............Hope, Ind.
Colaw, Orrie Omer........Rest, Kan.
Cortright, Charles Nathan...Dixon.
Criswell, Lizzie.............Chicago.
Danek, Eric Jacob..........Chicago.
Daniel, William Andrew............. Hogansville, Ga.
Detrick, Hiram E........York, Neb.
Dewell, Maud...........Cushing, Ia.
Dewey, Anson Cyrus.................. Hemlock, Wis.
Diehl, Herman...............Lanark.
Doggett, Lucy Frances.............. McKinney, Tex.
Dorr, Harry Arthur...Table Grove.
Dulaney, Joseph Field............... McKinney, Tex.
Easley, John Robert.................. Alexandria, Neb.
Edelman, Frank James....Chicago.
Eder, George Joseph.................. Crown Point, Ind.
Elsner, Fred Hamroad.....Chicago.
Fallon, Charles Milton.............. Hot Springs, S. D.
Fetherston, Samuel Hutchinson..... Chicago.
Flanders, Ruth Eunice.............. Elkhorn, Wis.
Frank, Joseph Samuel....Chicago.
Garlick, Jedediah...Fairview, Utah.
Giffen, Roy R............Fowler, Cal.
Goff, William Willis.................. Beaulieu, N. D.
Grace, Paul..............Harrisburg.
Gregg, Thomas Duncan............. Harrisburg.

Griffith, Edward Luke.Farm Ridge.
Grotjan, Frederick Samuel.......... Rock Island.
Hamer, George Henry..Park Ridge.
Hawley, Robert Coleman............ Mound City.
Heath, Bert Orcutt..Newfield, N. Y.
Hebsacker, Carl L.............Cairo.
Helm, George Herbert...Algonquin.
Hennig, Charles Herman............ Oshkosh, Wis.
Hensley, Harry Yates.......Clinton.
Hewitt, Howard H..........Chenoa.
Hoffman, Robert Perry.............. Bloomington.
Hofmann, Frank Phillip............. Ottumwa, Ia.
Hoke, Volney George..Morris, N. Y.
Hoover, Judson Wilkes.............. Mt. Pleasant, Ia.
Hunsaker, Edmund Franklin........ Liberty.
Jackson, Harry A.............Aledo.
Jackwitz, Norden.......Decorah, Ia.
Jewell, Bert.........Dodgeville, Wis.
Jewell, Edward Hill................. Thompson, Mich.
Julian, Harry W.............Leland.
Kampman, William.........Chicago.
Keeler, Walter Centennial.......... Freeport.
Kidder, Thomas Chase......Monica.
Klossoski, Frank John........Dixon.
Knick, William John........Chicago.
Lambrecht, John Richard..Chicago.
Lamm, John Joseph....Decorah, Ia.
Lemke, Charles Herman...Chicago.
LeSaulnier, Albert Frederick........ Red Bud.
Levering, Morgan Alexander........ Mt. Gilead, O.
Loesing, August Christian.......... Sheboygan, Wis.
Lutz, John Erwin..Puyallup, Wash.
Marquette, Will George............. Watertown, Wis.
McComb, Ernest Hubert............ Lebanon, Mo.
Meehan, Louis Florence............. Waterloo, Ia.
Merritt, Clyde Alvin..Meadville, Pa.
Meyer, Walter Paul..Morton, Minn.
Meyer, Edouard George....Chicago.
Miller, Carroll Morten................ Laurens, S. C.
Morrison, John Adam..Table Grove.
Mott, Dana Willis..........Chicago.
Mueller, William Daniel...Chicago.
Muesse, Fred William................ Lancaster, Wis.
Norton, Paul Stewart.......Normal.
Nuetzel, John George.......Chicago.
Oldberg, Olga...............Chicago.
O'Leary, Daniel James.....Chicago.
Pease, Everett J........Lowell, Wis.
Peck, David Ransford..Waldo, Wis.
Prindle, Charles W....Sharon, Wis.
Reaugh, George........Rock Island.
Reed, Frederick Glyde.......Quincy.
Reed, Walter Henry................. Corning, N. Y.
Renaud, Joseph Thomas Ubald..... Perth, Ont., Can.
Reynolds, Albert......Austin, Minn.
Robinson, Fred Stephen............. Armstrong, Ia.
Roby, George Hewitt.......Chicago.
Roemer, Herman........Mt. Pulaski.
Rose, William Ernest...Harrisburg.
Schmidt, Hugo.......Oshkosh, Wis.
Selby, James Joseph..........Peoria.
Serr, Peter L.........Scotland, S. D.
Shaffer, Sadie........Redfield, Mich.
Snider, Ralph Warren.......Peoria.
Soleman, Fred Armstrong.......... Tama, Ia.
Stewart, David Everett.............. Greenwood, Wis.
Street, Sidney Beman................ Columbus, Miss.
Talty, Nicholas Peter.Waterloo, Ia.
Vasumpaur, Rudolph Robert........ Chicago.
Wachowski, John George..Chicago.
Walbridge, Ernest Lucien............ Beloit, Wis.
Weaver, Harold Townsend.......... Schuyler, Neb.
White, John Franklin......Chicago.
White, James W............Chicago.
Wickmann, Ludvig Frederik v. Buelow ....Chicago
Woelke, Edward Charles...Chicago.
Wold, Walter Edward................ Austin, Minn.
Wright, George Irving............... Klamath Falls, Ore.
Wright, Walter Woodruff............ Adrian, Mich.
Zerbst, Edward Andrew.............. St. Joseph, Mo.
Zillig, John Adam, Jr..Dubuque, Ia.
Zinn, Herman.........Oshkosh, Wis.

HONORS—June, 1898.

John Edward Henry Bornhoeft.
Francis Joseph Butler.
Roy Tuttle Eaton.
Benjamin Edwin Jones.
Samuel Henry Sheppard.

The Gilpin Langdon, and Company prize was awarded to Adolph Neumann.

GRADUATES.

DEGREE OF PHARMACEUTICAL CHEMIST.

Brinkman, Oscar, Chicago. Practicing in Chicago.
Dyas, Clair Sedgwich, Chicago. Assistant Chemist in the Alkaloidal Department of Parke, Davis & Company, Detroit, Mich.
Liska, Anton, Chicago. Practicing in Chicago.
Oakley, Robert William, Moline, Ill. Pursuing the course in Medicine at Northwestern University Medical School.
Patten, Elmer Eugene, Omaha, Neb. Practicing in Leadville, Colo.

DEGREE OF GRADUATE IN PHARMACY.

Allemong, Harry Milton, Lanark, Ill. Practicing in Chicago.
Bangert, Louis Edward, Peru, Ill. Pursuing the course for the degree of Pharmaceutical Chemist at Northwestern University School of Pharmacy.
Becker, Caroline Mary, Elkader, Ia. Practicing in Elkader.
Bell, Edward, Millbrig, Ill. Practicing in Millbrig.
Blaesser, Walter Andrew, Hawarden, Ia. In business for himself in Cherokee, Ia.
Bodenschatz, John, Lemont, Ill. Located in Lemont.
Bornhoeft, John Edward Henry, Chicago. Practicing in LaGrange, Ill.
Brock, Humphrey David, Chicago. Practicing in Chicago.
Brown, Leonard George, Eugene, Ore. Practicing in Eugene.
Burdick, Orson Arthur, Chicago. Located in Chicago.
Butler, Francis Joseph, Pontiac, Ill. Practicing in Pontiac.
Christensen, Fritz Walter August, Racine, Wis. Located in Racine.
Corr, Edward, Salix, Ia. Practicing in Valentine, Neb.
Culbertson, Allie Maud, Danvers, Ill. Located in Danvers.
Cutler, Charles Clarence, Ft. Madison, Ia. Practicing in Ft. Madison.
DaCosta, Albert Raphael, Jr., Chicago. Studying Medicine in Chicago.
Davis, William Ward, Libertyville, Ill. Practicing in Libertyville.
Dee, Charles Oscar, Ogden, Utah. Practicing in Salt Lake City.
Donaldson, Willard, Chicago. Located in Chicago.
Druehl, Walter Frank, Salt Lake City, Utah. Practicing in Salt Lake City.
Eaton, Roy Tuttle, Watsonville, Cal. Pursuing the course for the degree of Pharmaceutical Chemist at Northwestern University School of Pharmacy.
Eilers, Gustav Herman, Oshkosh, Wis. Practicing in Oshkosh.
Gothard, James, Chicago. Practicing in Chicago.
Grube, Alfred Peter August, Sheboygan, Wis. Located in Sheboygan.
Hackrott, Henry George, Ackley, Ia. Practicing in Britt, Ia.
Higgins, Raymond Jordan, Chicago. Practicing in Chicago.
Humphreys, Maude, Sioux City, Ia. Practicing in Louisville, Ky.
Hutchison, Andrew Alexander, Milltown, Me. Practicing in Loda, Ill.
Illing, William August, Evansville, Ind. Located in Evansville.
Janett, Martin, Sheboygan, Wis. Practicing in Sheboygan.
Jayne, Edwin, Muscatine, Ia. Practicing in Muscatine.
Jertelius, Henry, Chicago. Practicing in Chicago.
Jones, Benjamin Edwin, Portland, Wis. In business for himself at Wells, Minn.
Jones, Thomas Owen, Rewey, Wis. Practicing in Rewey.
Koch, Adolph Charles, Maryville, Mo. Pursuing the course for the degree of Pharmaceutical Chemist at Northwestern University School of Pharmacy.

Koehler, Gottfried Henry Charles, Orland, Ill. Pursuing the course in Medicine at Northwestern University Medical School.
Kremer, Berthold James, Fond du Lac, Wis. Practicing in Fond du Lac.
Lee, Henry Cooley, Chicago. Located in Chicago.
Lewis, Charles Frederick, Belvidere, Ill. Located in Belvidere.
Littler, Charles Alvador, Marion, Ind. Practicing in Muncie, Ind.
Lockhart, Carl Wright, Elo, Wis. Practicing in Chicago.
Lott, Harvey Vansyckle, Elmwood, Ill. Located in Elmwood.
Mackie, William Robert, St. Louis, Mo. Practicing in St. Louis.
Marean, William Andrew, Freeport, Ill. Practicing in Freeport.
Marshall, Thomas Eggleston, Ripon, Wis. Located at Ripon.
Matthiesen, John Christian, Clinton, Ia. Practicing in Clinton.
McConochie, Hubert, Cambria, Wis. Practicing in Milwaukee, Wis.
McLean, Claire French, Urbana, Ill. Pursuing the course for the degree of Pharmaceutical Chemist at Northwestern University School of Pharmacy.
Mikkelsen, Niels, Nysted, Neb. Located in Omaha, Neb.
Moran, Thomas Francis, Waukesha, Wis. Practicing in Waukesha.
Morehead, Frank Addison, Watsonville, Cal. In business for himself at San Jose, Cal.
Mosier, David Clark, Atlantic, Ia. Practicing in Atlantic.
Neumann, Adolph, Dubuque, Ia. Practicing in Chicago.
Newman, Hardy, Chicago. Located in Chicago.
Newman, Michael, Chicago. Practicing in Chicago.
Oellrich, Herman Theodore, Chicago. Located in Oak Park, Ill.
Orth, Charles Henry, Morton, Minn. Practicing in Morton.
Perkins, George Young, Paris, Ill. Practicing at Paris.
Potter, Herbert Leverett, Eddy, N. Mex. In business for himself at Eddy.
Preisendorfer, Adam John, Defiance, O. Practicing at Defiance.
Rich, Clifford Lewis, Buffalo, N. D. Located at Buffalo.
Riesen, Walter Paul, Milwaukee, Wis. Practicing in Milwaukee.
Rodgers, Frank, Watsonville, Cal. Practicing at Watsonville.
Schroeder, George Fred Carl, Chicago. Located in Chicago.
Sheppard, Samuel Henry, Mt. Pleasant, Ia. Pharmacist in the Hospital for the Insane at Mt. Pleasant.
Smith, Francis Clement, Avon, Ill. Practicing at Avon.
Sperling, Frank, Bushnell, Ill. Located at Bushnell.
Steadman, Prescott Lawrence, LaJara, Colo. In business for himself at Pueblo, Colo.
Steiner, Noah Webster, Morrison, Ill. Practicing in Chicago.
Stephan, Otto, Dixon, Ill. Practicing in Chicago.
Stevens, Lona E., Denver, Colo. Located in Denver.
Stocker, George Absalom, Pana, Ill. Practicing at Pana.
Streich, Edwin August, Oshkosh, Wis. Pursuing a medical course in Chicago.
Striegel, John Peter, Waterloo, Ia. Practicing in Waterloo.
Taylor, Justus Earl, Gridley, Ill. Practicing in Wichita, Kan.
Thomas, Albert Raymond, Plato Center, Ill. Practicing in DeKalb, Ill.
Viestenz, Rudolph Ferdinand, Arthur, N. D. Practicing in Casselton, N. D.
Ward, William Henry, Manchester, Ia. Located in Manchester.
Watz, Herman George, Saginaw, W. S., Mich. Practicing in Saginaw.
Wescott, Charles Edward, Chillicothe, Ill. Practicing in Chillicothe.
Whiteside, John Claxton Burroughs, Edwardsville, Ill. Located in Edwardsville.
Williams, Samuel William, Columbus, Wis. Practicing in Chicago.
Windeguth, Edward Henry, Chicago. Located in Chicago.
Wolford, George Franklin, Plymouth, Ind. Located at Plymouth.
Woolley, Ida Margaret, Streator, Ill. Pursuing a medical course.
Woolston, Alvah Stevens, Clinton, Wis. Practicing in Clinton.
Wright, John Franklin, Canon City, Colo. Located at Canon City.
Yeo, Norman Hoskin, Hallock, Minn. Practicing in Chicago.
Yerger, Charles Francis, Chicago. Located in Chicago.
Young, John William, Jacksonville, Ill. Practicing in Jacksonville.

UNIVERSITY OF ILLINOIS

PRESIDENT'S OFFICE.